

**Effects of the 1996 Beach / Habitat Building Flows on
Riparian Vegetation in Grand Canyon
Final Report**

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PREFACE

Although the United States is officially on a course towards joining the rest of the world in embracing the metric (SI) system of measurement, old habits and ways of thinking change slowly in a place where 100,000 years is considered an eye blink. Because most references to places, and indeed many of the place names, in the Colorado River corridor of Grand Canyon are based on river mileage downstream of Lees Ferry, we use miles for designation of distance along the river corridor (river miles, or RM in this report). Similarly, because dam managers and those who have worked in the river corridor have historically referred to discharge from Glen Canyon Dam in terms of thousands of cubic feet per second (kcfs), we will do so in this report. Conversions to SI equivalents are straightforward: cubic meters per second (CMS) = kcfs * 0.0283 and river kilometers (rKm)= river mile * 1.61. All other measurements of plants and habitats are in SI units.

There are many sources for determining plant identities in the southwestern United States. Often, these give conflicting names, depending on differences of opinions of the authors of the floras, taxonomic revisions more recent than the source, and so on. We follow the naming conventions in Kartesz and Kartesz (1994) in this report. We commonly use acronyms for plant names to speed up our data collection. To make the interpretation of the data files appended to this report possible, we have provided a glossary of these abbreviations in Appendix A which also serves as a list of species encountered in this report.



ABSTRACT

We measured the effects of the March and April 1996 experimental beach / habitat building flow on riparian vegetation in the Colorado River corridor of Grand Canyon National Park. We used vegetation maps developed in 1995 at nine monitoring sites as the basis of our assessments. These maps divided each of nine sites into internally consistent vegetation patches, or vegetation polygons.

We separated the effects of the flood on plants in the polygons into four categories: extant vegetation, weed species, surface organics, and substrate. We recorded the effects on extant vegetation in terms of the amount of damage to vegetation, depth of new sediment deposited, the severity of vegetation and sediment scour, and the presence of clumps of dislodged *Cladophora* algae and the presence of piles of organic debris (the "bathtub ring"). We also compared the areal extent of wetland vegetation polygons in 1995 to that in 1996 to look for impacts of the high flows on this important resource. To test for the effects of the flows on species of different growth forms we compared the vegetation vertical structure, measured as the number of live vegetation contacts with a survey rod in the intervals 0 - 0.3 m, 0.3 - 1.0 m, 1.0 - 2.0 m, 2.0 - 4.0 m, and above 4.0 m in 1995 and 1996. We saw little effect on wetland polygons during our censuses six months after the flood. There was an immediate effect in terms of burial of some marshy areas, but most of these had recovered sufficiently within six months to be classified again as marsh vegetation. And although some polygons had been altered enough that they were classified as a different polygon type, areas lost were compensated for by conversion of other patches to wetland types and / or increases in the areas of remaining polygons. In addition, only

the lowest interval in the vertical structure data, made up of herbs and grasses, was consistently affected by the flows. At seven of nine sites, vegetation was removed or buried such that this layer lost significant numbers of contacts. The three sites furthest downstream showed significant increases in the number of contacts around one meter indicating, we believe, that the flows had a beneficial effect on some species, including species of *Carex*, *Typha*, *Phragmites*, and *Salix*.

We compared the distribution of adults of three weed species before and after the flood to determine short-term effects on their populations. The short-term effects of the flows were minimal: there was almost no difference in the number of polygons in which three species of interest (*Eragrostis curvula*, *Erianthus ravennae*, and *Lepidium latifolium*) were found, nor was there a real difference in the number of sites in which they were found. We determined the longer-term effects by comparing the seed banks of polygons before and after the flood. Again, there was no measurable, consistent effect on seed banks of these species. Overall, however, seed banks after the flood had roughly 80 % fewer of both individuals and species than those before the flood in the same spots. These effects must, however, be interpreted in light of the fact that these are likely to be transient seed banks which have high turnover rates on an annual basis simply from germination and losses of either viability or cues for germination.

We also measured the effects of the high flows on organic debris in the nine monitoring sites. We recorded the position of the high water mark "bathtub ring" of debris deposited by the flood, and any other significant deposits of debris from the flood when we encountered them in the field. In addition, we assessed the effects of the flood on the depth of the surface organic material, or duff, in the polygons by comparing the 1996 and 1995 duff depth measurements

taken during monitoring activities. We showed that although the loss of duff was significant in three of the nine sites, the other sites showed no significant differences between years. We attribute this to the very small amounts of duff present and the high variability in the effects of the flows on individual polygons.

Finally, we noted several significant effects of the flood on substrates, especially the homogenization of particle sizes. Although there was no consistent effect of the flood on average particle sizes within sites, there was a significant loss in variability, due mostly to the loss or burial of fine sediments in return current channel settings. We also noted a change in the topography of return channel transects in which marsh vegetation had been surveyed as part of earlier monitoring projects. The effects were seen mainly as a narrowing and shallowing of the channel due to deposition of sediments.

Although the 1996 Beach / habitat building flows were a success in other ways, especially administratively and in moving sediment from the channel bottom to high elevation deposits, they failed in their planned effects on new high water zone vegetation. The minimal effects described by this report and by the Hualapai Division of Natural Resources indicate that the projected scour of vegetation and resetting of the successional clock did not occur. We recommend that future flows be planned at greater discharge levels for a shorter time. The former characteristic would insure that the greater force required to remove vegetation would be realized. The latter characteristic would prevent too great a loss of the nutrient-rich fine soils from the system.

INTRODUCTION

Flooding is an important and nearly universal organizing force in terrestrial riparian habitats in the desert areas of the southwestern U.S. (Carothers and Aitchison 1976, Franz and Bazzaz 1977, Johnson et al. 1989, Baker 1990). Flood frequency, duration, and intensity can determine the identity and success of plant species growing near rivers in desert riparian areas (Szaro and DeBano 1985, Stromberg et al. 1993, Auble et al. 1994). With changes in flood frequency and intensity, plant assemblages change dramatically (Stromberg and Patten 1990, Stromberg 1993, Auble et al. 1994, Kearsley and Ayers 1996, Nilsson et al. 1997).

Since the completion of Glen Canyon Dam more than 30 years ago, major changes have taken place in riparian habitats in the Colorado River corridor between the dam and Lake Mead (Turner and Karpiscak 1980). With the stabilization of flows and control of most flooding, a diverse set of plant assemblages has become established in what had previously been scoured bare by high annual flows (the new high water zone; Carothers and Aitchison 1976, Turner and Karpiscak 1980, Johnson and Carothers 1982). These assemblages themselves have undergone a series of changes associated with unplanned floods and alterations to the dam release patterns (Stevens and Waring 1986, Kearsley and Ayers 1996, Stevens et al. 1996).

One goal of the experimental beach/habitat building flow is the removal of new high water zone vegetation. By removing vegetation and reworking the substrates in habitats close to the river, the Bureau of Reclamation and National Park Service hoped to reopen some camping

beaches which had become too vegetated to use. In addition, they hoped to return flooding as a community organizing force and restore some of the natural forces which shaped the pre-dam biotic communities (Bureau of Reclamation 1995).

Flooding and Riparian Habitats

The impacts of flooding on riparian habitats are measurable in several ways. Many studies have shown that vegetation is scoured out completely or damaged by some combination of swift-moving current, sediment, or entrained debris (Minckley and Clark 1984, Platts et al. 1985). In fact, most southwestern riparian communities rely on periodic flooding to remove non-riparian and non-native species and create conditions conducive to the regeneration of the community (Johnson et al. 1989, Stromberg et al. 1993). Before the construction of Glen Canyon Dam, high flows during the spring runoff would completely remove riparian vegetation almost annually in the river corridor of Grand Canyon (Turner and Karpiscak 1980, Webb 1996).

Second, floods affect the distribution of seeds and can alter the contents of the seed bank in riparian areas. In many ways the seed bank represents the ability of sites to recover from major disturbances (Thompson and Grime 1979, Leck and Simpson 1987) and often contains species which have not appeared locally for long periods of time (Keddy and Reznicek 1982, Thompson 1992). Flooding can distribute seeds of riparian species into areas where they have not been previously found (Hansen 1918, Staniforth and Cavers 1976, Barrow 1992, Pysek and Prach 1993). Alternatively seeds can be scoured from the soil, prevented from germination by burial under soil or debris (Bertness and Ellison 1987, Bertness 1992). Thus, seeds in the soil which form the basis of regeneration and / or succession can be profoundly affected by flooding and thus affect the ability of a site to recover from disturbance.

Third, the characteristics of germination sites, including soil texture, nutrients, moisture holding capacity, small-scale topography, and temperature regimes may be severely altered by the scouring and deposition of sediment. Previous flooding in this system have had strong negative effects on the quality of germination sites for important riparian species by depositing coarser substrates which had lower moisture holding potential and nutrient contents (Stevens and Waring 1986). In other situations, coarser sandy soils may be better for germination (Brock 1986), or other conditions, which correlate with soil texture, may have an overriding importance (Horton et al. 1960, Harper et al. 1965). In addition, deposition of soil during flooding may move the soil surface, where germination takes place, further above the water table.

Fourth, the distribution of invasive exotic species may be altered by high flows. It is known that the invasion by exotic species into an area can be greatly facilitated by the presence of a riparian corridor (Pysek and Prach 1993). Established exotic plants may be removed from the system by scouring either along with natives or at greater rates than natives (Johnson et al. 1989, Stromberg et al. 1993). Alternatively, the seeds of these species, or viable plant fragments, may be spread downstream with other organic debris (Hansen 1918, Schneider and Sharitz 1988, Harmon and Franklin 1995).

Finally, floating mats of plants and organic debris may be floated out of sites and may then be deposited in places where it affects future plant growth. In some systems, the presence of flood-borne debris has a beneficial effect on germination, serving as a kind of "mulch" (Huenneke and Sharitz 1986) and plant growth is often greatest in areas where piles of organic debris are greatest (Hansen 1918, Smith and Kadlec 1985). In other systems, burial by piles of debris results in the smothering of existing plants and the death of all seeds present (Bertness and

Ellison 1987, Bertness 1992).

Research Objectives

Because the effects of flooding tend to be multi-layered, we approached the assessment of flood effects of the Beach / habitat building flows by addressing a series of questions. First, what is the effect of the flood on extant vegetation? If the flood were to be successful, we would expect to find a severe loss of vegetation, especially of wetland types which are closest to the water and hence most susceptible to the effects of high flows. We also expected to find physical damage to woody vegetation, burial under new sediment, and reworking or deposition of entrained debris. Second, what is the effect of the flood on three important exotic plant species? We were specifically interested in *Lepidium latifolium*, a Eurasian perennial mustard, *Eragrostis curvula*, a South African bunchgrass, and *Erianthus ravennae*, a large Eurasian bunchgrass which has received much attention from the National Park Service in Grand Canyon. If the flood were successful the adults of these species would be removed from the system, but their seeds and propagules may be redistributed both within sites and downstream. Third, are germination sites affected by high flows such as these? Given the observed effects of the 1983 and 1986 / 1987 high flows (Stevens and Waring 1986), we expected that soil texture, a correlate of moisture holding potential and soil nutrients, would shift towards coarser particles which are correlated with lower germination site quality. And finally, how did the high flows affect the topography of marshes and marshy areas? By design, the high flows should reactivate the return channels in which much of the wetland vegetation in Grand Canyon is found. In addition, because the most recent high releases from Glen Canyon Dam in 1987 were comparable to these flows, so we expected that the topography after these flows would also be similar.

Previous Work

In previous studies, we and others have shown strong effects of the operation of Glen Canyon Dam on riparian plant assemblages (Kearsley and Ayers 1996, Stevens et al. 1996). For example, assemblages in marsh and low channel margin habitats, where plants were well established before flow levels were reduced by the imposition of interim flow criteria, plots have shown moderate to severe effects of drying out (Kearsley and Ayers 1996). Where substrates have been newly exposed by the reduction of flows, many species, including both annuals such as *Erodium*, *Conyza*, and *Gnaphalium*, and perennials including *Lepidium*, *Tamarix*, and *Muhlenbergia*, are rapidly colonizing both fine and coarse grained substrates (Kearsley and Ayers 1996). Other habitats, especially those higher and further removed from the river, have not been affected in any way we could measure.

As part of a related study (Kearsley and Ayers 1996), we have mapped vegetation in a series of nine sites (Table 1) for inclusion in the Glen Canyon Environmental Studies Geographic Information System (GCES GIS) for the past two years. Our maps have been digitized in ARC INFO, and georeferenced with ground control points so that they can be referenced by the local coordinate system and, where available, the state plane coordinate system (Werth et al. 1993). These site maps, covering from 300 to 700 meter sections near river miles 43.1 L, 51.2 L, 55.5 R, 68.2 R, 71.4 L, 93.9 L, 122.8 L, 194.0 L, and 209.0 L (R and L indicate side of the river, facing downstream), have become the basis of transition year and long term monitoring of vegetation. Additional sites, at 6.5 L and 249.4 L were added during fiscal year 1996 to include the Glen Canyon National Recreation Area and Hualapai Tribal lands in long-term monitoring, but were not part of the flood work reported on here.

Table 1. Vegetation mapping sites and other studies which had been performed in them in previous years. These do not include flood studies which were conducted in many of these same sites.

| River Mile | Site Name | Geomorphic Reach | Special GIS Study Site | Other Studies ¹ |
|------------|---------------------|------------------|------------------------|----------------------------|
| 43.1 L | Anasazi Bridge Camp | 6 | 3 | M,V,G,S |
| 51.2 L | Unnamed Camp | 6 | | M,V,G,S |
| 55.5 R | Kwagunt Marsh | 6 | 4 | M,V,G,C |
| 68.2 R | Tanner Beach | 7 | 5 | M,V,S |
| 71.4 L | Cardenas Marsh | 7 | 5 | M,V,A |
| 93.9 L | Granite Camp | 8 | 6 | M,V,S |
| 122.8 L | Forster Camp | 9 | 7 | M,V,S |
| 194.1 L | Hualapai Acres | 12 | 10 | M,V,S,G |
| 209.0 L | Granite Park | 12 | 11 | M,V |

¹ M = Interim Flows vegetation mapping, V = Interim Flows vegetation study plots, G = NAU groundwater studies, S = NAU sandbar studies, C = ASU climatology / productivity studies, A = Avifauna Studies

Existing Vegetation Maps

We based our flood data collection on the vegetation maps developed in the late summer of 1995 from aerial photos and on-the-ground censuses. These maps are divided into polygons, or patches of internally consistent vegetation which is distinct from surrounding patches. The data available for each polygon included such information as plant species presence, percent plant species foliar cover, foliage vertical structure, and depth of the surface organic layer. In

this section we will briefly describe how these attributes were determined.

For each of nine sites, we made 400% color laser Xerox enlargements of the aerial photos taken during the 1995 Memorial Day 8 kcfs constant flows. To create the maps we laid Mylar on the enlargements and delineated vegetation polygons. We checked the boundaries of these polygons during an August 1995 field trip. On the ground we moved, deleted, or added boundaries according to conditions we encountered. For example, an area may have looked distinct from an adjacent area on the photograph but on the ground the difference may have been simply a change in soil texture or color.

During that same trip, we assessed both the floristics and structure of vegetation in the polygons. To assess a polygon floristically, we recorded a comprehensive species list for the whole polygon. We then made from one to five estimates of percent foliar cover for each species in randomly located plots within the polygon (see the Random Point section below). At each random point, we sampled circular plots of up to three meters radius in which we made estimates of percent foliar cover for all species present in the plot. We averaged these estimates to produce the polygon estimate of foliar cover for all species. Species which were present but not encountered in any of the estimates were arbitrarily assigned a trace cover value of 0.001%.

We measured foliage vertical structure by measuring live plant contacts in a series of height intervals at a series of randomly located points (see Random Point section below) which were not necessarily the same points as those used for vegetation assessment. At three to eight random points within each polygon, we counted the number of live contacts with a fiberglass survey rod in the intervals 0 - 0.3 m, 0.3 - 1.0 m, 1.0 - 2.0 m, 2.0 - 4.0 m, and > 4.0 m. At these same points we measured the depth of the duff to the nearest 0.1 cm.

METHODS

The work described in this report was performed during a series of downstream river trips. Pre-flood conditions were documented during both the August 1995 vegetation monitoring trip (floristics, structure, and duff) and during a February 1996 trip run in conjunction with the Northern Arizona University Sandbar Studies Group (return-channel topography, sediment texture, surface organics and seed bank assessment). Marsh topography for all sites but two was measured by the N.A.U. Sandbar Studies Group during an April trip without vegetation personnel. Post-flood vegetation damage evaluations, substrate assessments, and seed bank collections and the topographic survey of one marsh were done during a May 1996 downstream trip. Vegetation censussing, duff and vertical structure measurements were made during the August / September 1996 vegetation monitoring trip.

Random Point Selection

Many of our methods rely on sampling at randomly selected points within polygons. Because polygons varied widely in size and shape, not all could be sampled in identical manners. In this section we describe the several methods we used for locating a random point using a table of six-digit random numbers.

In large polygons (5 to 20 m diameter), we used the six digit numbers in a pace-turn pattern. The readers would walk through the polygon until directed by the recorder to stop. From that point the recorder would direct the reader to the random point using the six-digit number. The first digit was used as the number of paces forward, the second as a direction (even = right, odd = left), the third as a number of paces, the fourth as a direction, and the fifth as a number of paces. In the cases of sampling vertical structure and soil texture transects, the sixth

digit was used to determine if the rod were to be placed an arm's length to the right (even) or left (odd) from the final step.

In the cases where a polygon was long but narrow (< 3 m wide), we used a series of two-digit numbers for sampling during a transit of the polygon. The reader would walk along the long axis of the polygon until directed to stop by the recorder. The recorder would then direct the reader by using the first digit was the number of paces forward, and the second was whether to sample to the left (digits = 0 to 2), straight ahead (digits 3 to 6), or to the right (digits 7 to 9).

To sample small (< 3 m diameter) and / or narrow polygons in which through transit would have caused damage or posed a danger (e.g., steep slopes or heavy vegetation), or take an unnecessary amount of time (e.g. extremely thick Tamarisk stands) we often used an around-and-in approach using two-digit random numbers. In this method, the reader would walk around the periphery of the polygon until the recorder told them to stop. The first digit of the pair was then used as the number of paces along the perimeter, the second was the number of paces to be walked into the polygon.

The fact that we were working in irregularly shaped and often small patches of habitat required that we be flexible when applying these methods. There were times when these methods needed to be slightly modified to meet unique situations. If pacing would cause the reader to exit the polygon, the reader could pace to the margin, turn 180° and continue pacing back into the polygon. Alternatively, the reader could convert the number of paces to a percentage of the distance to the margin and use that number.

Flood Effects on Vegetation

We took both descriptive and analytic approaches to describing the flood effects on

vegetation. Our descriptive approach divided the effects of the flood on extant vegetation into four categories. These were damage to vegetation, burial of plants by deposition of sediment, removal of vegetation by scouring, and cladding of vegetation with clumps of dislodged *Cladophora* algae during the flood. As outlined in the paragraphs below, each of these was recorded on its own scale. Because these were descriptive data, no statistical analyses were performed.

Damage. We noted damage on a subjective scale when one or more effects of vegetation damage to woody species were noted. These included such things as stripping of leaves and bark, and breaking of branches or trunks. These were noted on a 0 to 3 point scale (none, minor, moderate, and severe). Minor damage included one or two instances of bark stripping, one or two cases of the removal of leaves, and no branch breakage. Moderate damage was characterized by more bark stripping, more leaf removal, and a few cases of branch breakage. We deemed damage severe in cases when most woody individuals had bark stripped off on the upcurrent face, branches broken, and leaves stripped off.

Deposition. We attempted to record the amount of new sand deposited above the pre-flood soil surface. Our estimates were based on our knowledge of the area, position of the root crown relative to the new surface, and the old aerial photos. Because we did not have time to dig test pits in each polygon, we estimated the depth of deposition and converted it to an ordinal 0 to 3 scale. A score of zero indicated no deposition in the polygon, one indicated less than 5 cm, two indicated 5 to 15 cm, and 3 indicated significant deposition greater than 15 cm.

Scour. We noted soil and plant scouring in polygons where it was evident. We used the pre-flood aerial photos and our knowledge of the patch, and other cues to determine if surface

soil and plants had been removed. We used a binary scale (0 = none, 1 = some plants and / or substrate removed) to record scour.

Algae. We recorded whether or not clumps of dead *Cladophora* algae were hanging from shrubs and trees in the polygon. This was a good indicator of both the height of the water and of current passing through during the flood. We measured this as presence / absence of the algae in the patch. Based on the position of the highest piece of algae in the polygon, we recorded the depth of water at each of up to eight points per polygon.

Our analytic measures of flood effects involved comparing vegetation data from the August / September 1996 monitoring trip with the 1995 census data. We sampled floristics and structure in the same way we had done in 1995. We will briefly describe those methods here.

We took three or more floristics samples in randomly located circular plots of up to 3 m radius per polygon during the 1996 sampling trip. We repeatedly calibrated our percent cover estimates by making all members of the field crew sample one or two polygons together before the rest of the day's sampling began. The calibration also involved using a 0.5 x 0.5 m square frame to provide a visual demonstration of what approximately 1% cover entailed in a 3 m radius plot ($0.25 \text{ m}^2 / 28.27 \text{ m}^2 = 0.9\%$). We also took up to eight point contact, vertical structure measurements per polygon at the same time. These included measurements of the depth of the duff at the sample point as well as the number of live vegetation contacts with a fiberglass survey rod in the intervals 0 - 0.3 m, 0.3 - 1.0 m, 1.0 - 2.0 m, 2.0 - 4.0 m, and above 4.0 m.

Because the Memorial Day 1996 aerial photos had been done in black and white, which makes the interpretation of vegetation data difficult, our strategy for relocating polygon boundaries involved using the enlarged 1995 photos and maps with the black and whites as a

guide for detecting major changes. In the field, we redrew polygon boundaries and made notes on copies of the 1995 mylar maps. The fact that all the methods used to create the enlargements of both years' photos were identical (flight path, altitude, camera, print size, percent enlargement, etc.) allowed us to overlay the 1995 map on the 1996 black and whites to compare gross scale changes in shorelines and approximate polygon boundaries.

Once the Labor Day 1996 color aerial photos became available in September and October, we remapped the 9 sites. We again began with 400% enlargements of the photos and redrew the 1995 site perimeter on an overlaid sheet of mylar. We then drew a set of polygon boundaries based on three criteria detailed below.

First, 1995 polygon boundaries were used as a guide. Because our approach was to be a description of the fates of 1995 polygons, we tried as much as possible to preserve the polygon structure from those maps. Much of the vegetation differences among polygons were likely based on geomorphic setting, substrate, and topography (elevation above the water table), all of which are strongly influenced by prior flooding of the site (Stevens et al. 1995). Because the last flood to cover these sites was of approximately the same magnitude, we expected that this flood would leave similar initial conditions and that polygon boundaries would not be difficult to find.

Second, polygon boundary notes made during our field work in 1996 were used to guide changes in polygon boundaries on the new maps. There were slight differences in the position of the plane which took the photos, so field changes were not directly transferable to the new maps.

Third, field notes made during the 1996 censuses were also used. Sometimes, these indicated that adjacent polygons were not distinct enough anymore to merit separation, so two or more could be combined. Other times, our field notes indicated that the flood had caused a

major discontinuity within a polygon which warranted creating two where there had only been one before.

In order to measure gross effects of vegetation removal and / or burial by the flood, we first summed across all estimates of species cover in each of our samples to generate a total cover per sample. We then averaged samples within polygons to generate a polygon total cover estimate. We then used the paired non-parametric Wilcoxon T to compare total foliar cover in 1996 with that in 1995 within sites. Because there were nine sites total, we used a Bonferroni-adjusted significance level of 0.0055 (= 0.05 / 9 sites; Sokal and Rohlf 1995, page 240). To test for overall effects we compared cover in all sites with a two-way ANOVA with site and flood as effects.

We also compared the areal extent of polygons dominated by wetland species. These tend to occur in the lowest elevation areas, closest to the river, and hence are subject to the strongest effects of flooding. We began by classifying vegetation polygon data from both years simultaneously, and using polygon areas and changes within vegetation type as a measure of overall vegetation change. We used two-way indicator species analysis (TWINSPAN; Hill et al. 1975, Hill 1979), a polythetic divisive classification program to separate plots into different types. TWINSPAN is especially well suited to classification of vegetation data (see review in Gaugh 1980, pages 209 - 210) and has been used in this system in previous studies (Kearsley and Ayers 1996, Stevens et al. 1996). We examined the TWINSPAN divisions after six levels, and ignored those which did not make biological sense. For example, divisions based on the presence of 10 % versus 20 % cover of annual bromes were not used. The result was the classification of polygons in each site into four to eight distinct types. We wish to point out that

the classification of vegetation types in this report is entirely *ad hoc*, and was done solely for the analysis to be described here. However, given the methods used to collect the data, our groups can be cross-walked to regional and national classification schemes.

Our focus here was on polygons dominated by obligate wetland species such as *Typha*, *Phragmites*, *Juncus*, and *Scirpus*, since wetland vegetation is such a rare but important component of riparian vegetation in the river corridor (Stevens et al 1996). Within each site we compared the total area of polygons classified as "wetland" in 1995 to that in 1996. We based this classification on whether a polygon was dominated by species considered obligate wetland species in Arizona (see Reed 1988). If a polygon was classified as wetland in both years, we used area data from both years in the analysis. If a polygon changed to another type in 1996 or changed to a wetland type polygon in 1996 from something else in 1995, it was assigned an area of "0" in 1996 or 1995 respectively. To avoid problems with spatial independence, we combined data within sites before analyzing it. Because the data to be used were before- and after flood areas, and because we could not make assumptions about the distribution of the data, we used a non-parametric paired comparison, the Wilcoxon T, to compare areas in the two years.

Finally, to test for the effects of the high flows on species of different growth forms and sizes, we compared the vegetation vertical structure of polygons in 1995 and 1996. We compared the number of live vegetation contacts with a fiberglass survey rod in the intervals 0 - 0.3 m, 0.3 - 1.0 m, 1.0 - 2.0 m, 2.0 - 4.0 m, and above 4 m in each year using a MANOVA for each site with flood and polygon as factors. To keep the experiment-wide error rate low, we used a Bonferroni adjusted significance level of 0.0055 (= 0.05 / 9 study sites; Sokal and Rohlf 1995 page 240). After running the MANOVA, we performed univariate ANOVA tests for each height

increment with flood and polygon as factors. We used a Bonferroni adjusted significance level of 0.01 (= 0.05 / 5 levels) to keep the experiment-wide error rate low.

Invasive Exotic Species

We examined the effects of the flood on the distribution of exotic species in two ways. First, we compared the distribution of adult plants before and after the flood. Second, we compared the seed banks of polygons before and after the flood to test for longer-term effects of the flood on the removal of weedy species.

To compare the distribution of adults of three important weed species, we used the 1995 and 1996 monitoring data. Within sites, we compared the number of polygons in which we found individuals of *Eragrostis curvula*, a South African bunch grass, *Erianthus ravennae*, a Eurasian bunch grass, and *Lepidium latifolium* a Eurasian perennial mustard. Because these were descriptive data, and because we found either no differences or very small differences between years, we did not subject the data to statistical analysis.

To test for the effects of the flood on the weed seed bank, we collected three seed soil samples from each polygon at randomly selected points (see Random Point section above) before and after the flood. Each sample contained approximately 100 to 200 g fresh weight of soil. The sample, which included surface duff, was collected from the top 10 cm of the soil.

We potted approximately 100 g of each sample in 7 cm square pots which had a small square of moistened paper at the bottom to prevent soil loss during watering. We then placed the pots on a misting bench at the NAU Research Greenhouse and kept them moist as seeds germinated. The watering schedule included 15 seconds of mist every 16 minutes plus a daily thorough wetting with a watering can. After six weeks, the misting schedule was adjusted to five

seconds every 32 minutes, and two of the daily waterings per week were done with half strength 10-10-10 soluble fertilizer.

As seedlings became identifiable, we recorded their numbers and identity, and discarded them. We identified many common species based on vegetative characters before flowering took place. For example, our experience in the field made it easy to identify small individuals of *Typha domingensis*, *Gnaphalium chilense*, *Baccharis emoryi*, and *Isocoma acradenia*, among others. Others which were less distinctive, such as species of *Erigeron* and *Centaurium* could not be identified until flowers were present. We recorded the number of polygons in which the three species occurred but, because numbers were so small, we did not analyze the data statistically. For each site, we summed across samples within polygons and compared the total number of seedlings in pre- and post-flood samples using a Wilcoxon T. We also compared the total number of species using the non-parametric paired Wilcoxon T. We compared both measures of seed bank health across all sites using an ANOVA with site and flood as factors.

Surface Organics

We measured two aspects of the flood's effects on surface organic material. First during our post-flood assessment we estimated the position of the "bathtub ring" of flood-borne debris in each site. During our other activities in a site, we sketched the position of the debris on a field copy of the map. This was later submitted for digitization by members of the GCES / GCMRC GIS group. During our polygon condition assessment we also noted whether or not large amounts of flood debris were present.

In addition, we measured whole-polygon changes in the depth of the duff layer. We compared the duff depth data taken during the August 1996 monitoring trip with the 1995 values

in the pre-existing data sets for each polygon. We measured duff depths at four to eight randomly located points per polygon both times. For polygons which had been entirely eroded by the high flows, we recorded a "0" for depth in 1996. We took the mean duff depth in a polygon for each year and used a Wilcoxon T to compare pre- and post-flood conditions. To test for a whole-Canyon effect of the high flows on surface organics, we analyzed all sites' duff data with an ANOVA in which flood, site, and polygon nested within site were factors.

Substrates

We measured two separate effects of the flood on substrates. First, we assessed average particle sizes in the polygons before and after the flood. Second, we compared surface elevations along pre-established transects through marshes at eight interim flows monitoring sites.

We measured changes in particle size using a subjective texture scale. The scale covered the range from pure clay (1.0) to silt (2.0) to coarse sand (3.0), and the score of any sample was based on the texture, appearance, and response to wetting and rolling. Soils which were finer and rolled into tubes when wet, scored lower on the scale. Those which were fine (little or no grittiness), but did not roll easily when wet scored in the middle of the scale. And those which were coarse, and appeared to have particles approaching 1 mm in diameter scored higher on the scale. We measured scores to the nearest tenth of a point.

To quantify the actual particle size distribution of actual scores, we collected a series of reference samples, up to five samples per tenth-point increment in the interval between 2.0 and 3.0. We then sieved these into different size fractions, including clay/silt (< 0.062 mm), fine sand (0.062 - 0.125 mm), medium sand (0.125 - 0.250 mm), coarse sand (0.250 - 1.0 mm) and coarse sand and gravels (> 1.0 mm) (figure 1). Percentages in each fraction were averaged across

samples in that increment to give a mean distribution for each scale score. We used these data to calculate mean particle size per tenth-point increment by multiplying the percent in each increment by the center of the increment. The percent in the clay / silt fraction was multiplied by 0.05 mm and that in the > 1.0 mm was multiplied by 1.0 mm.

Before and after the flood, we measured polygon substrate texture using the subjective scale. Beginning at random points and moving along random bearings from those points, we took measurements at one-meter intervals along a five meter transect. We also measured the texture of the seed soil samples to get three additional independent assessments of texture per polygon. As these samples were potted, we recorded the texture of the sample. To compare pre- and post-flood conditions, we converted the scale measurements to an average particle size. To test for changes within sites, we used a two-way Welch ANOVA for equality of means when variances may not be equal (Welch 1951) with polygon and flood as effects. We also compared all sites simultaneously with the same test with site, flood, and polygon nested within site as factors. To test for differences in variability in pre- and post-flood soil texture within sites, we used a Levene's test for equal variances (Levene 1960) within sites. We also ran an all-site Levene's test to assess the effects of the high flows on substrate texture in all our sites simultaneously.

Because one of the goals of the high flows was to reactivate return current channels and rebuild backwaters in the return current channels, we surveyed the elevations of transects through eight marshes. These marshes had been surveyed twice per year from 1992 to 1995 (Stevens and Ayers 1995, Kearsley and Ayers 1996). Sites had been selected as part of studies from GCES Phase 1 and Interim Flows studies. Within these sites, vegetation dominated by obligate- or

facultative wetland species had developed since 1987 either in return current channels or on top of low platform sandbars which had been periodically inundated. In return current channel settings, between 4 and 15 transects had been laid across the channel at approximately 10 m intervals from the head of the return channel to the mouth with sample points on transects laid in at 1 m increments. Transects were named according to their position, with transect A at the head of the channel and transect D, F, I, J, or O at the mouth and points along each transect numbered from zero upwards from the talus end to the beach end.

On low bar marshes, 1 m² plots were arranged at 10 m intervals along transects perpendicular to the river channel. At Kwagunt Marsh (RM 55.5 R), transects were laid out every 10 meters, and named in increasing order from upstream (A) to downstream (R), except for transects X, Y, Z, and ZZ, which were the first through fourth, respectively, transects upstream from transect A. At Cardenas Marsh (RM 71.4 L), transects were laid out on 20 m intervals perpendicular to the river channel and named in increasing order from downstream (B) to upstream (Z), skipping every other letter.

To measure the surface elevations of marsh transects before and after the flood, we worked with members of the GCES Survey Department and the N.A.U. Sandbar Study Group, using standard GCES Survey Department protocols (Beus et al., 1992). Surveyors from these groups would survey the entire site including these transects. In the office, data from the site survey were used to create a surface model of the entire site using SDR MAP software. We then used the coordinates of stakes at the end of the transects as endpoints of a line across the surface, and pulled surface elevations off at one meter increments on the lines from return current channel marshes, and at 10 meter increments on platform marshes. In this way we were certain of having

measurements from standard surface points. In the case of one marsh (Cardenas, RM 71.4 L), miscommunication between our group and that of the NAU Sandbar Studies group led to there being no post-flood survey. This marsh was excluded from any analysis. We compared pre- and post-flood elevations of each transect using a paired t-test.

RESULTS

Flood Effects on Vegetation

We recorded the effects of the flood in terms of vegetation damage, deposition of sediment, scour of sediment and vegetation, and deposition of algae. These effects of the flood do not lend themselves to statistical analysis. They are contained in Appendix B of this report, and are discussed generally below.

Vegetation damage varied widely among polygons within sites. As one would expect, the strongest effects were on polygons closest to the river and those at lower elevations. In most of the sites, the damage was most obvious in polygons at the upstream end of reattachment bars and in polygons near the riverbank on debris fans. These latter types of polygons were damaged when portions of the debris fans were overtopped by the flood. Deposition also varied within sites. As with vegetation damage, it tended to be greatest at the upstream end of reattachment bars. Within this general pattern, there were cases where polygons had both deposition and scouring occur, perhaps at different stages of the experimental flood's hydrograph.

Scouring was, in most cases, limited to channel margin and eddy margin habitats. Scour was especially strong at the channel margin in debris fan settings at Granite Camp, and at the upstream end of Kwagunt marsh. In the case of the latter site, several polygons were completely lost as a result of eddy patterns changing at high flows and the consequent removal of substrate

and vegetation.

The flood also had effects on the distribution of surface organic material. We delineated the "bathtub ring" and piles of coarse debris in the sites. The line followed the high water mark generally, although in some cases there were large stacks of debris stopped short of the high water mark by contact with vegetation. Overall though, we were impressed mostly with the limited nature of most of the debris piles.

The effects of the high flows on duff depth varied across sites. Three sites (43 L, 55 R, 209 L) lost significant amounts of leaf litter and debris during the flood (Figure 1). There were

Table 2. Effects of the experimental flood on mean duff depths at the nine mapping study sites. Depths are given in centimeters.

| Site | Pre-Flood | Post-Flood | T ¹ | d.f. ² | Significance |
|-------|-----------|------------|----------------|-------------------|--------------|
| 43 L | 0.75 | 0.227 | -97.0 | 32 | p < 0.001 |
| 51 L | 0.43 | 0.41 | -49.5 | 32 | n.s. |
| 55 R | 1.11 | 0.27 | -245.5 | 34 | p < 0.0001 |
| 68 R | 0.33 | 0.59 | 16.5 | 24 | n.s. |
| 71 L | 1.32 | 1.47 | 8.0 | 27 | n.s. |
| 94 L | 0.16 | 0.37 | -3.0 | 22 | n.s. |
| 123 L | 0.13 | 0.32 | -60.5 | 27 | n.s. |
| 194 L | 0.24 | 0.32 | 15 | 32 | n.s. |
| 209 L | 0.53 | 0.25 | -128 | 28 | p < 0.005 |

¹ Value listed is the paired non-parametric Wilcoxon T statistic comparing polygons within sites before and after the flood.

² d.f. = test degrees of freedom

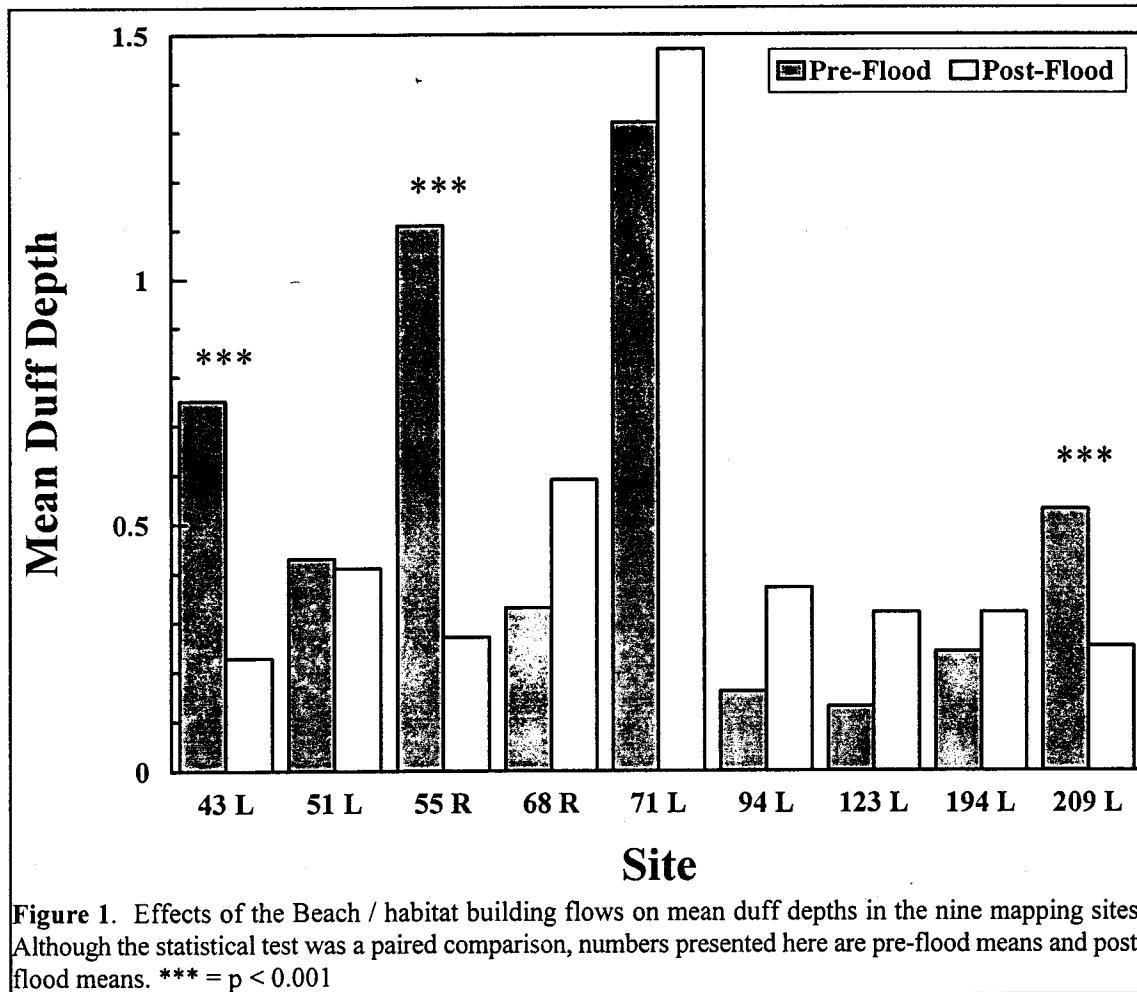


Figure 1. Effects of the Beach / habitat building flows on mean duff depths in the nine mapping sites. Although the statistical test was a paired comparison, numbers presented here are pre-flood means and post-flood means. *** = $p < 0.001$

insignificant changes, both positive and negative in the other sites (Figure 1, Table 2). An overall test for changes in duff depth showed a slight, but non-significant effect of the flood (pre-flood = 0.532 cm, post-flood = 0.438 cm; $F_{(1,258)} = 1.13, p > 0.01$).

In addition to the damage, deposition, scour, and algae data, we also collected data on foliar cover by species for each polygon during an August / September sampling trip. We only sampled those polygons which were partially or entirely affected by the flood. The data are attached to this report as Appendix C. The vertical foliage structure data collected at the same

time, along with duff depth estimates, are contained in Appendix D of this report.

Our analytic approach to measuring effects of the high flows gave results that showed significant effects on total foliar cover, but little effect when examined more broadly as changes in the areas of patch types. The total foliar cover comparisons showed that polygons lost significant amounts of cover in seven of the nine sites (Figure 2). The two upstream sites, at 43 L and 51 L, showed non-significant changes in total cover. Downstream from that however, all sites lost significant amounts of cover (Figure 2, Table 3). An overall test, across all sites, showed a significant loss of vegetation ($F_{(1,492)} = 42.2$, $p < 0.001$). On average, sites lost approximately 20 % of their vegetative cover (64.9% versus 43.4 %).

When viewed on a broader perspective, in terms of changes in areas of different vegetation types, there was very little effect. Comparing the total area of patches dominated by wetland species in the nine sites, we saw cases where areas increased, decreased, or remained the same (Figure 3). No sites showed a significant changes in area covered by wetland vegetation (Table 4). One of the sites (94 L) had a seven-fold increase in the total area of wetland plant patches, but two of the five polygons so identified lost 10 % and 70 % of their original area. This pattern of variability in flood effects was common, and was most likely responsible for our finding of no significant impact.

When we examined vertical structure in our nine sites we found very little effect. Only two of the sites, 55 R and 194 L, showed significant differences in the overall vertical structure from their 1995 measurements (Figure 4). Although four of the other sites showed changes which differed at the 5% significance level, they were not significantly different from their 1995

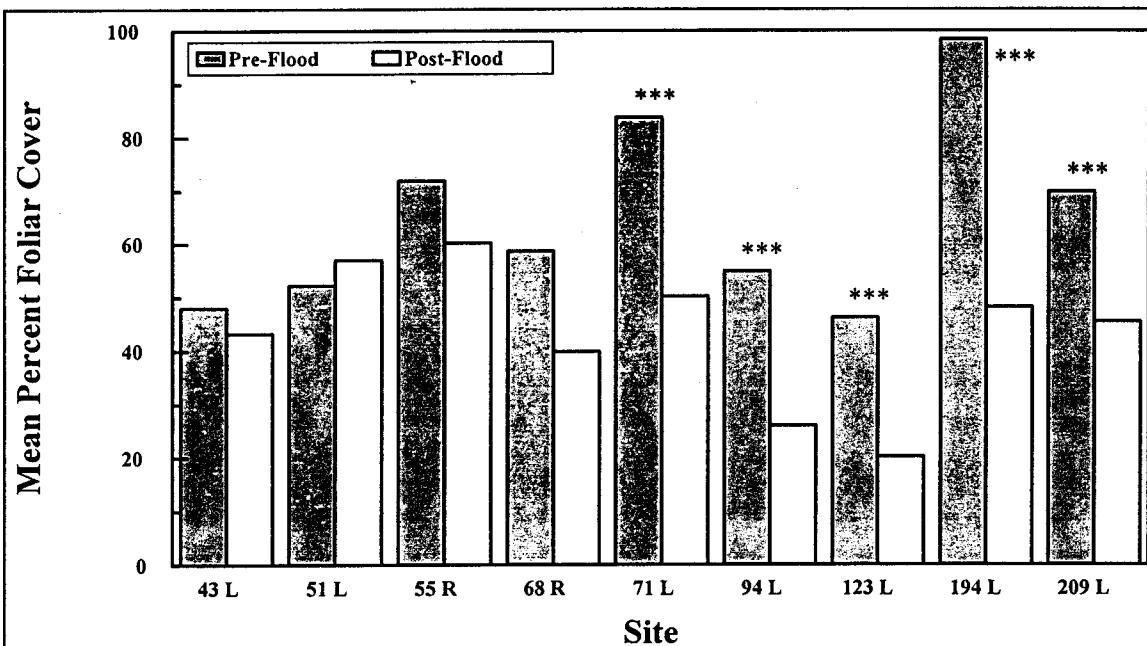


Figure 2. Effects of the high flows on mean total percent foliar cover in the nine mapping sites. Asterisks indicate significant differences with the Bonferroni adjustment to the Wilcoxon T test.

Table 3. Effects of the high flows on mean percent foliar cover in the nine mapping sites. Numbers are means and (standard error) across all polygons within sites.

| Site | Cover 1995 | Cover 1996 | t-statistic ¹ | d.f. ² | Significance |
|-------|-------------|------------|--------------------------|-------------------|--------------|
| 43 L | 48.1 (6.1) | 43.2 (6.8) | -1.13 | 24 | n.s. |
| 51 L | 52.3 (6.2) | 57.0 (7.0) | 0.67 | 29 | n.s. |
| 55 R | 71.9 (5.0) | 60.2 (6.7) | -2.09 | 34 | n.s. |
| 68 R | 58.7 (6.3) | 39.9 (6.9) | -3.15 | 21 | n.s. |
| 71 L | 83.8 (8.2) | 50.2 (5.6) | -5.76 | 27 | p < 0.001 |
| 94 L | 54.9 (10.6) | 26.0 (7.0) | -4.20 | 19 | p < 0.001 |
| 123 L | 46.3 (7.5) | 20.2 (4.5) | -5.49 | 32 | p < 0.001 |
| 194 L | 98.4 (8.7) | 48.2 (5.3) | -7.31 | 34 | p < 0.001 |
| 209 L | 69.9 (9.1) | 45.5 (5.3) | -3.70 | 30 | p < 0.001 |

¹ Value of the paired t-test statistic

² Test degrees of freedom

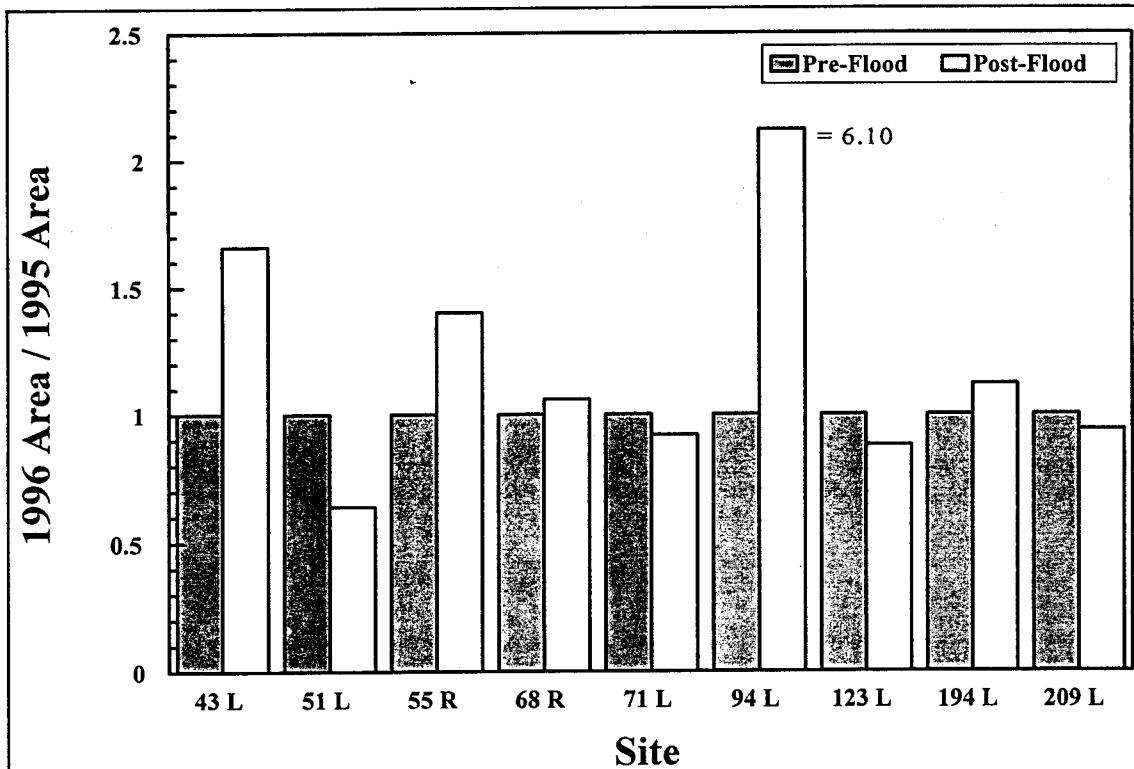


Figure 3. Effects of the high flows on total areal extent of polygons defined by obligate wetland plant species within each of the nine mapping sites. None of the changes, either positive or negative were significant. The value for 94 L post-flood area is not proportional to its height.

Table 4. Total number and areal extent of polygons dominated by obligate wetland species in the 1995 and 1996 censuses.

| Site | 1995 | | 1996 | | % Area Change | Significance ¹ |
|-------|--------|------|--------|------|---------------|---------------------------|
| | Number | Area | Number | Area | | |
| 43 L | 3 | 412 | 4 | 683 | 65.8 | n.s. |
| 51 L | 12 | 5879 | 13 | 5190 | -11.7 | n.s. |
| 55 R | 12 | 3460 | 12 | 4854 | 40.3 | n.s. |
| 68 R | 7 | 5342 | 7 | 5684 | 6.4 | n.s. |
| 71 L | 7 | 3805 | 7 | 3499 | -8.0 | n.s. |
| 94 L | 3 | 579 | 5 | 3533 | 510.2 | n.s. |
| 123 L | 4 | 1605 | 4 | 1407 | -12.3 | n.s. |
| 194 L | 7 | 2794 | 7 | 3121 | 11.7 | n.s. |
| 209 L | 2 | 85 | 2 | 81 | -4.7 | n.s. |

¹ Results of a Wilcoxon T test comparing areas before and after the flood.

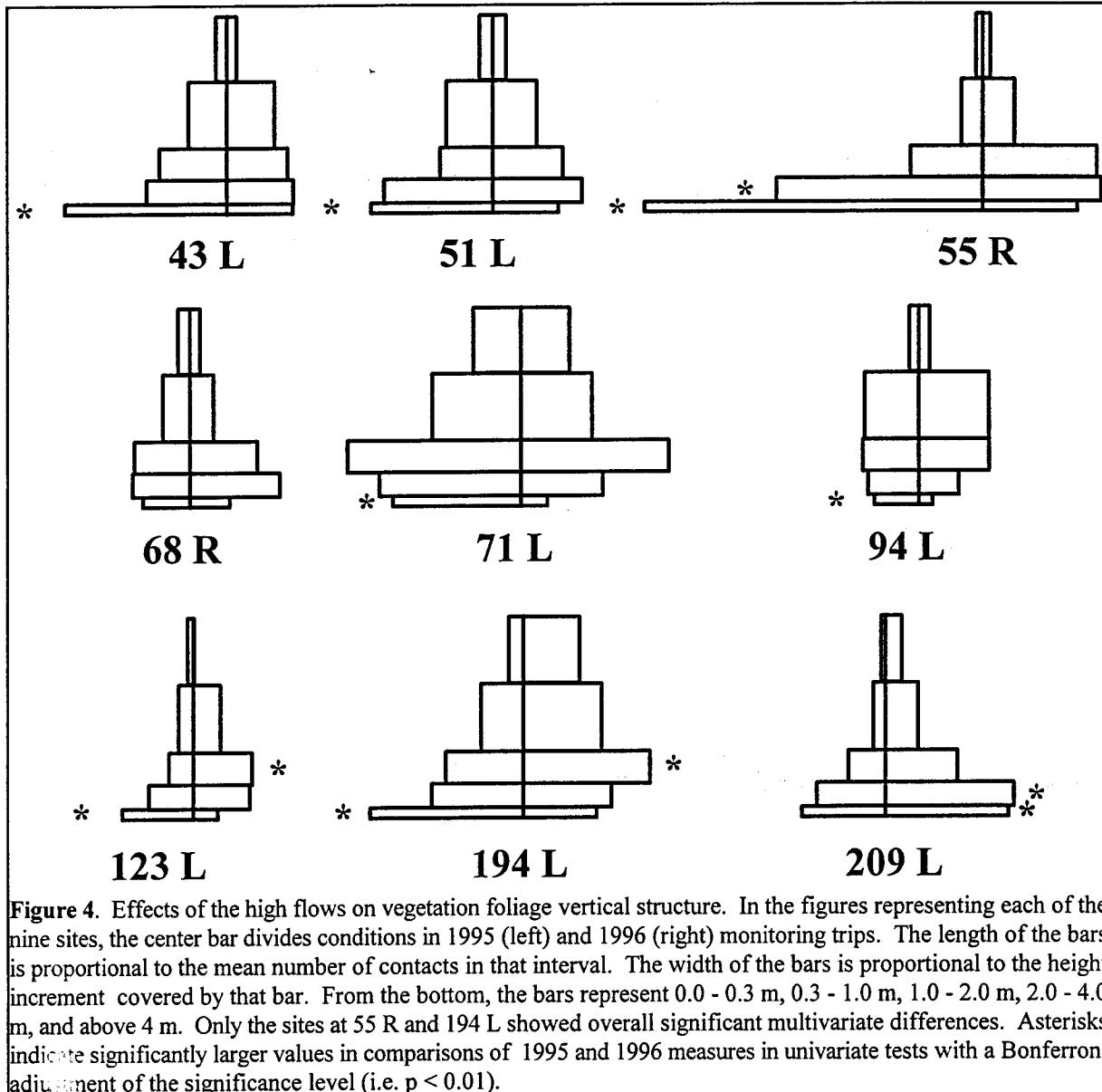


Figure 4. Effects of the high flows on vegetation foliage vertical structure. In the figures representing each of the nine sites, the center bar divides conditions in 1995 (left) and 1996 (right) monitoring trips. The length of the bars is proportional to the mean number of contacts in that interval. The width of the bars is proportional to the height increment covered by that bar. From the bottom, the bars represent 0.0 - 0.3 m, 0.3 - 1.0 m, 1.0 - 2.0 m, 2.0 - 4.0 m, and above 4 m. Only the sites at 55 R and 194 L showed overall significant multivariate differences. Asterisks indicate significantly larger values in comparisons of 1995 and 1996 measures in univariate tests with a Bonferroni adjustment of the significance level (i.e. $p < 0.01$).

Table 5. Effects of the high flows on vegetation structure. For each site, the MANOVA F-statistic, based on Wilks' Lambda, is listed, followed by site-wide means in each height increment in 1995 and 1996, the pooled standard error for that increment, and the probability of a difference that large, based on a paired t-test.

| 43 L | | MANOVA F _(5,29) = 1.22, p = 0.32 | | | |
|-----------|--|---|-----------|------|-------------|
| Height | | 1995 Mean | 1996 Mean | s.e. | Probability |
| 0.0 - 0.3 | | 3.05 | 1.23 | 0.53 | 0.01 |
| 0.3 - 1.0 | | 1.54 | 1.22 | 0.17 | 0.20 |
| 1.0 - 2.0 | | 1.27 | 1.14 | 0.16 | 0.58 |
| 2.0 - 4.0 | | 0.75 | 0.87 | .014 | 0.53 |
| > 4.0 | | 0.21 | 0.17 | 0.06 | 0.69 |
| 51 L | | MANOVA F _(5,28) = 2.10, p = 0.10 | | | |
| Height | | 1995 Mean | 1996 Mean | s.e. | Probability |
| 0.0 - 0.3 | | 2.23 | 1.22 | 0.26 | 0.01 |
| 0.3 - 1.0 | | 1.98 | 1.69 | 0.34 | 0.55 |
| 1.0 - 2.0 | | 0.97 | 1.30 | 0.20 | 0.23 |
| 2.0 - 4.0 | | 0.85 | 0.91 | 0.15 | 0.75 |
| > 4.0 | | 0.19 | 0.25 | 0.09 | 0.64 |
| 55 R | | MANOVA F _(5,31) = 7.43, p < 0.0001 | | | |
| Height | | 1995 Mean | 1996 Mean | s.e. | Probability |
| 0.0 - 0.3 | | 6.60 | 1.70 | 0.66 | 0.001 |
| 0.3 - 1.0 | | 3.74 | 2.26 | 0.38 | 0.0097 |
| 1.0 - 2.0 | | 1.29 | 2.13 | 0.28 | 0.04 |
| 2.0 - 4.0 | | 0.36 | 0.61 | 0.12 | 0.14 |
| > 4.0 | | 0.40 | 0.48 | 0.04 | 0.86 |

Table 5. (Continued)

| 68 R | MANOVA F _(5,19) = 1.09, p = 0.40 | | | |
|-----------|--|-----------|------|-------------|
| Height | 1995 Mean | 1996 Mean | s.e. | Probability |
| 0.0 - 0.3 | 0.81 | 0.77 | 0.14 | 0.86 |
| 0.3 - 1.0 | 1.11 | 1.66 | 0.21 | 0.07 |
| 1.0 - 2.0 | 1.04 | 1.23 | 0.21 | 0.53 |
| 2.0 - 4.0 | 0.46 | 0.43 | 0.07 | 0.71 |
| > 4.0 | 0.22 | 0.19 | 0.05 | 0.77 |
| 71 L | MANOVA F _(5,23) = 3.15, p = 0.05 | | | |
| Height | 1995 Mean | 1996 Mean | s.e. | Probability |
| 0.0 - 0.3 | 2.34 | 0.53 | 0.40 | 0.004 |
| 0.3 - 1.0 | 2.60 | 1.44 | 0.37 | 0.04 |
| 1.0 - 2.0 | 3.20 | 2.70 | 0.59 | 0.08 |
| 2.0 - 4.0 | 1.61 | 1.31 | 0.40 | 0.46 |
| > 4.0 | 1.16 | 1.12 | 0.55 | 0.91 |
| 94 L | MANOVA F _(5,15) = 4.16, p = 0.014 | | | |
| Height | 1995 Mean | 1996 Mean | s.e. | Probability |
| 0.0 - 0.3 | 0.80 | 0.25 | 0.08 | 0.0004 |
| 0.3 - 1.0 | 0.86 | 0.72 | 0.14 | 0.51 |
| 1.0 - 2.0 | 1.08 | 1.32 | 0.23 | 0.47 |
| 2.0 - 4.0 | 0.94 | 1.38 | 0.20 | 0.13 |
| > 4.0 | 0.14 | 0.18 | 0.07 | 0.65 |

Table 5. (Continued)

| 123 L | MANOVA F _(5,22) = 3.86, p = 0.012 | | | |
|-----------|---|-----------|--------|-------------|
| Height | 1995 Mean | 1996 Mean | s.e. | Probability |
| 0.0 - 0.3 | 1.31 | 0.47 | 0.16 | 0.0015 |
| 0.3 - 1.0 | 0.83 | 1.09 | 0.17 | 0.31 |
| 1.0 - 2.0 | 0.43 | 1.14 | 0.17 | 0.007 |
| 2.0 - 4.0 | 0.17 | 0.46 | 0.10 | 0.04 |
| > 4.0 | 0.01 | 0.00 | 0.0006 | 0.33 |
| 194 L | MANOVA F _(5,27) = 4.41, p = 0.0046 | | | |
| Height | 1995 Mean | 1996 Mean | s.e. | Probability |
| 0.0 - 0.3 | 2.80 | 1.32 | 0.26 | 0.0004 |
| 0.3 - 1.0 | 1.65 | 1.60 | 0.25 | 0.88 |
| 1.0 - 2.0 | 1.41 | 2.33 | 0.28 | 0.01 |
| 2.0 - 4.0 | 0.81 | 1.54 | 0.20 | 0.03 |
| > 4.0 | 0.34 | 1.04 | 0.28 | 0.07 |
| 209 L | MANOVA F _(5,24) = 3.59, p = 0.01 | | | |
| Height | 1995 Mean | 1996 Mean | s.e. | Probability |
| 0.0 - 0.3 | 1.57 | 2.25 | 0.17 | 0.01 |
| 0.3 - 1.0 | 1.26 | 3.34 | 0.23 | 0.002 |
| 1.0 - 2.0 | 0.69 | 1.33 | 0.20 | 0.03 |
| 2.0 - 4.0 | 0.07 | 0.62 | 0.24 | 0.11 |
| > 4.0 | 0.03 | 0.28 | 0.11 | 0.15 |

levels after the conservative Bonferroni adjustment.

When we performed univariate comparisons of individual levels within sites, it became obvious why the multivariate tests were non-significant. The only foliage level which was consistently affected by the flood in sites was the herb-grass layer from 0.0 - 0.3 m (Figure 4, Table 5). This was obviously the result of the deposition of new sediment on top of grasses, low herbs, and seedlings of perennial seedlings. At one site, 209 L, there was a flush of growth of some exotic grasses, especially *Cynodon dactylon* which, coupled with very little deposition in that site, resulted in an increase in the number of contacts with vegetation in that site.

At three downstream sites, 123 L, 194 L, and 209 L, there was a significant increase in the density of vegetation in the 0.3 - 1 m or the 1 - 2 m interval (Figure 4, Table 5). We attribute some of this change to the positive effect the flood had on some species, especially *Typha domingensis*, and *Phragmites australis*. For example, at 194 L, much of the *Typha* in the return-current channel had been gradually drying out and dying (Kearsley and Ayers, 1996). After the flood, there were more and healthier *Typha* and *Phragmites* than had been seen there in three years (personal observations). This phenomenon was observed at 43 L and 71 L, but not in very many patches.

Effects on Exotic Species

The distribution of adult invasive exotic plant species did not change markedly as a result of the high flows (Table 6). Individuals of *Eragrostis curvula* showed up in one more polygon at 43 L, two fewer at 51 L, and did not appear in any new sites downstream. We did not detect any individuals of *Erianthus ravennae* in any sites, even though we had found them in two sites before 1996 (55 R and 71 L; Kearsley and Ayers 1996, Appendix K). Apparently the

Table 6. Distribution of three exotic species of concern in nine study sites. Table entries indicate number of vegetation polygons in which the species was found.

| Site | <i>Eragrostis curvula</i> | | <i>Erianthus ravennae</i> | | <i>Lepidium latifolium</i> | |
|-------|---------------------------|------------|---------------------------|------------|----------------------------|------------|
| | Pre-Flood | Post-flood | Pre-Flood | Post-Flood | Pre-Flood | Post-Flood |
| 43 L | 4 | 5 | 0 | 0 | 1 | 0 |
| 51 L | 9 | 7 | 0 | 0 | 6 | 9 |
| 55 R | 0 | 0 | 0 | 0 | 4 | 4 |
| 68 R | 0 | 0 | 0 | 0 | 0 | 0 |
| 71 L | 0 | 0 | 0 | 0 | 0 | 1 |
| 94 L | 0 | 0 | 0 | 0 | 1 | 0 |
| 123 L | 0 | 0 | 0 | 0 | 1 | 0 |
| 194 L | 0 | 0 | 0 | 0 | 1 | 0 |
| 209 L | 0 | 0 | 0 | 0 | 2 | 0 |

Table 7. Number of individuals and species germinating from soil samples before and after the high flows. Germination data were summed across samples within sites before being averaged within sites. s.e. = pooled standard error.

| Site | Number of Individuals | | | | Number of Species | | | |
|-------|-----------------------|-------|------|-------------|-------------------|-------|------|-------------|
| | Pre- | Post- | s.e. | Probability | Pre- | Post- | s.e. | Probability |
| 43 L | 15.6 | 3.8 | 3.3 | < 0.0005 | 3.35 | 0.74 | 0.34 | < 0.001 |
| 51 L | 26.8 | 3.3 | 4.2 | < 0.0001 | 3.13 | 0.44 | 0.25 | < 0.001 |
| 55 R | 48.4 | 4.8 | 4.3 | < 0.0001 | 5.38 | 0.74 | 0.37 | < 0.001 |
| 68 R | 2.3 | 0.4 | 0.6 | < 0.025 | 1.00 | 0.14 | 0.18 | < 0.01 |
| 71 L | 11.8 | 0.1 | 2.7 | < 0.0001 | 2.50 | 1.13 | 0.30 | < 0.01 |
| 94 L | 11.6 | 0.2 | 5.0 | < 0.05 | 1.50 | 0.28 | 0.30 | < 0.05 |
| 123 L | 4.1 | 0.3 | 0.7 | < 0.001 | 1.48 | 0.33 | 0.21 | < 0.001 |
| 194 L | 13.7 | 3.7 | 1.4 | < 0.0001 | 3.19 | 0.74 | 0.21 | < 0.0001 |
| 209 L | 4.3 | 1.5 | 1.1 | < 0.05 | 1.88 | 0.50 | 0.23 | < 0.001 |

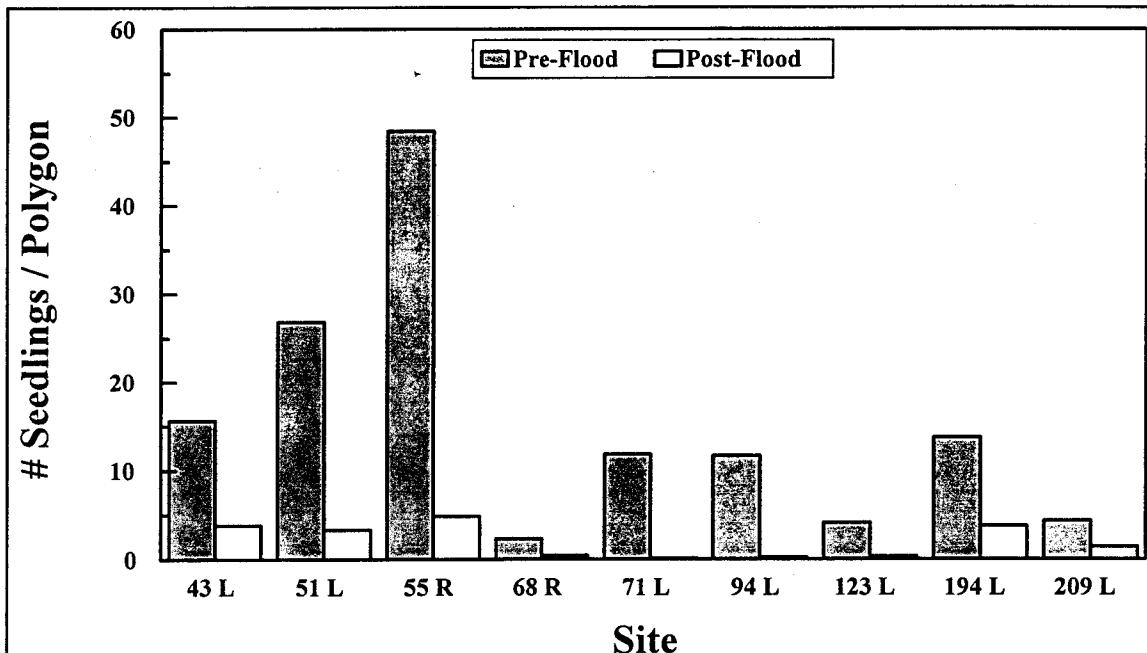


Figure 5. Mean numbers of seedlings germinating in polygon samples before and after the high flows. Numbers are summed across three samples per polygon.

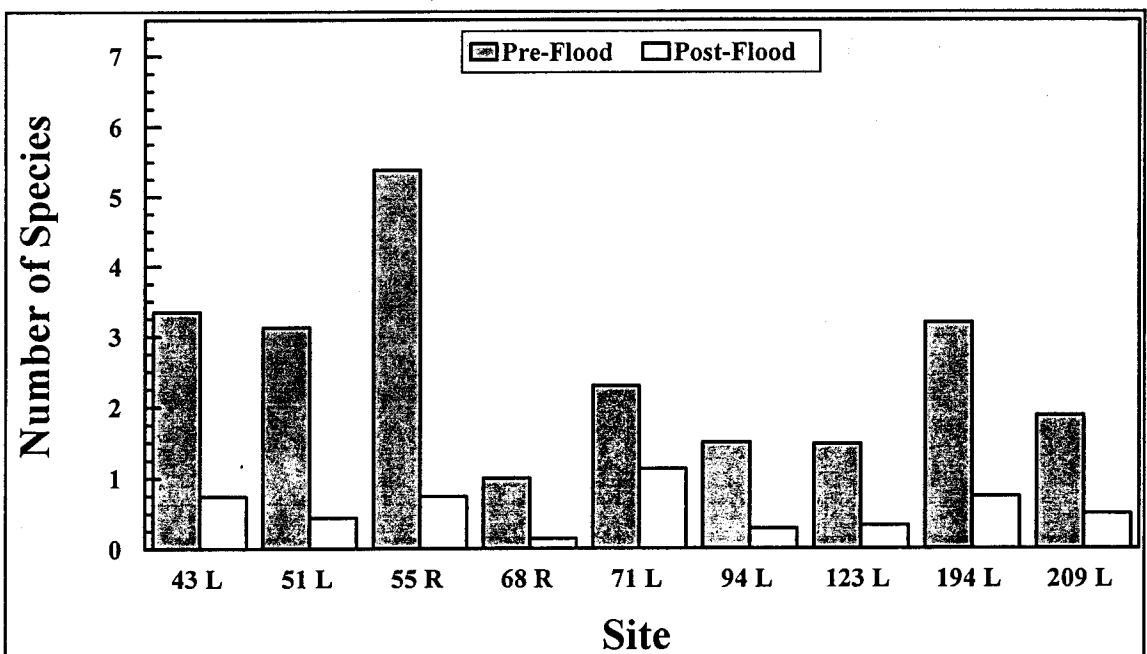


Figure 6. Mean number of species per polygon in samples before and after the high flows. Germination data from three samples per polygon were combined for this graph.

control efforts of the National Park Service are having an effect. Although *Lepidium latifolium* was not found in five sites where it had been seen in 1995, it was only a marginal presence in these sites before the flood. Also, in the site where it had the largest pre-flood presence, the species spread to three new polygons (Table 6).

Because of the low number of germinations of any of these species from our soil samples, it is difficult to make any definitive statements about the effects of the flood on these species. Pre-flood samples from only two polygons at only one site (43 L, polygons 23 and 59) produced any *Eragrostis curvula* seedlings. No post-flood samples produced seedlings of this species. Thus far no samples, from either pre- or post-flood periods, have produced any *Erianthus ravennae* seedlings. Finally, only one pre-flood sample from one site (209 L, polygon 34) produced seedlings of *Lepidium latifolium*. No post-flood samples produced *L. latifolium* seedlings. However, not all germinated seedlings have grown to where they can be identified; all sites except 123 L and 209 L have several individuals which are thus far only identified as "Grass," so the numbers of *E. curvula* and *E. ravennae* may change.

When we examined the effects of the flood on seed banks as a whole, we found a significant loss of both individuals and species richness (Figures 5, 6). In all sites, the polygon seed banks lost, on average, 82 % of the individuals present before the flood. The data, contained in Appendix E of this report, show that sites lost from 77 % to 99 % of their individuals on a per polygon basis. In all sites, the paired Wilcoxon T tests are significant at $p < 0.01$. Across all sites, there was a significant loss of seeds ($F_{(8,620)} = 47.88$, $p < 0.001$).

Similarly, the loss of species diversity, on a per polygon basis, was significant. On

average, sites lost 77% of their per polygon species diversity (Figure 6). Individual site losses ranged from 51% to 96 % (Table 7). When we compared seed bank diversity across all nine of our study sites, the loss of species was significant at that level as well ($F_{(8,620)} = 32.19$, $p < 0.001$).

Substrate Texture and Elevations

Substrate texture changed significantly, but not directionally, as a result of the flood (Figure 7). Overall there was no significant change in the average particle size across all sites ($F_{(8,628)} = 0.87$, n.s.). Individual sites at 55 R, 72 L, and 194 L did have significant differences between pre- and post-flood estimates, but they were not in a consistent direction. The sites at 55 R and 194 L were slightly, but significantly, coarser after the flood, while the third, 72 L, had slightly, but significantly, finer soils on average. The rest of the sites showed inconsistent, and non-significant changes in texture as a result of the flood (Figure 7).

The main flood effect on substrates was the homogenization across polygons within sites. With two exceptions (55 R and 68 R), all sites showed significant reductions in particle size variances, according to Levene's test (Table 8). Even at these two sites, there was some loss of variability. The all-site comparisons showed a significant loss of variation ($F_{(8,628)} = 18.9$, $p < 0.001$). An examination of Figure 7 shows that much of this loss of variability came through the loss of the finest soils within sites. For example, at 51 L, the range of post-flood particle sizes begins at what had been the pre-flood 25th percentile of particle sizes, and the post-flood 25th percentile of particle size corresponds to roughly the median of pre-flood values.

In our comparisons of marsh transect elevations we also found significant effects of the flood. At four of the seven marsh sites, we found that there was significant deposition of

Mean Particle Size

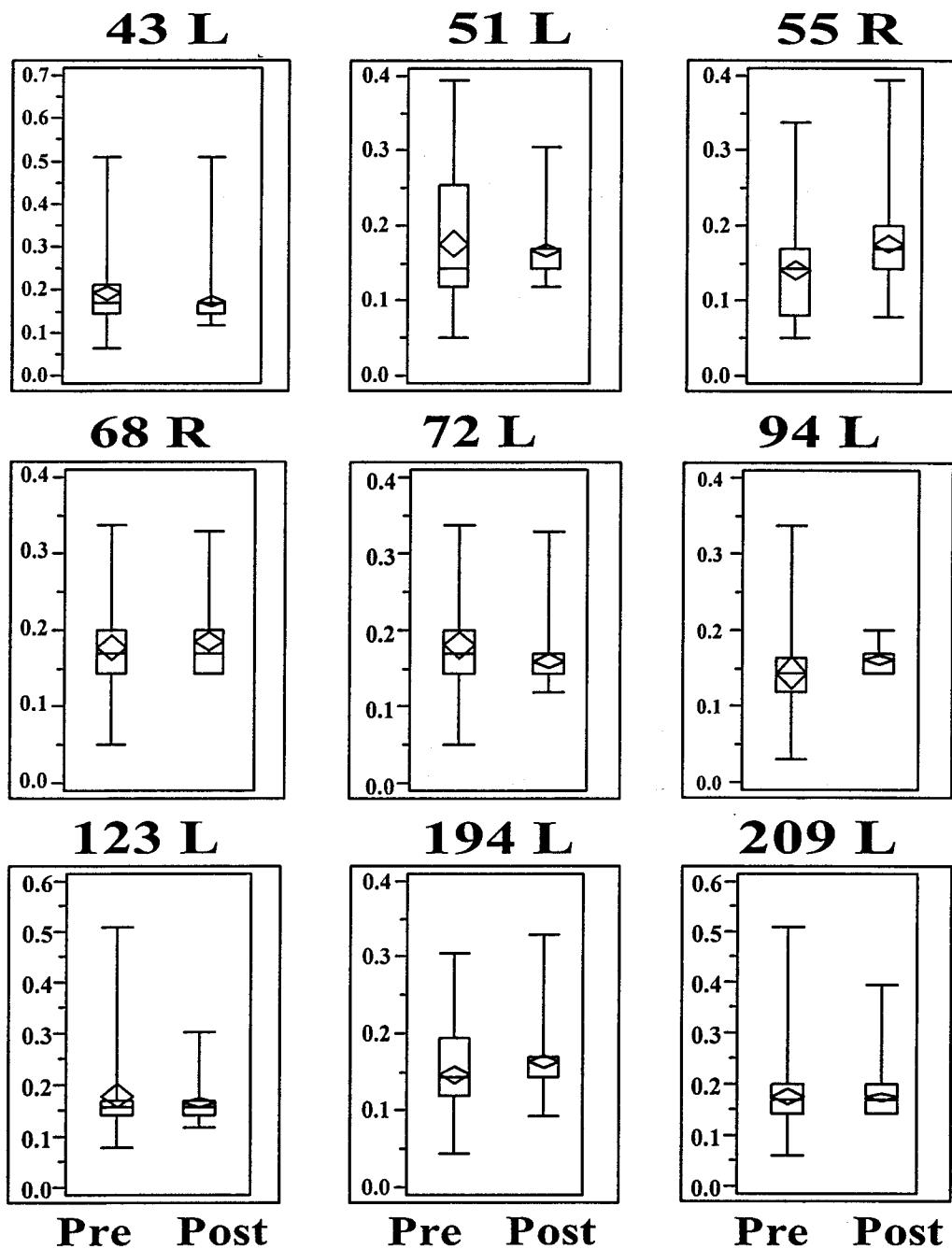


Figure 7. Effects of the high flows on substrate mean particle sizes in the nine mapping sites. Site means and variances from before (left) and after (right) are based on polygon means. Diamonds indicate mean (center) and standard error (top and bottom), boxes represent 25th (lower line), 50th (middle line) and 75th (top line) percentiles of values. Lines outside boxes indicate the total range of values.

Table 8. Effects of the experimental flood on soil texture. Figures represent site means and mean absolute deviation (for Levene's test) generated from averages of polygon samples. Asterisks indicate values which are significantly larger than their corresponding pre- or post-flood value based on Welch's ANOVA and Levene's test for equality of variances..

| Site | Mean Particle Size (mm) | | Mean Absolute Deviation | |
|-------|-------------------------|------------|-------------------------|------------|
| | Pre-Flood | Post-Flood | Pre-Flood | Post-Flood |
| 43 L | 0.195 | .176 | 0.050* | 0.031 |
| 51 L | 0.175 | .168 | 0.073* | 0.026 |
| 55 R | 0.146 | .179* | 0.426* | 0.415 |
| 68 R | 0.143 | .178 | 0.050* | 0.039 |
| 71 L | 0.182* | .162 | 0.055* | 0.025 |
| 94 L | 0.173 | .166 | 0.018 | 0.050 |
| 123 L | 0.180 | .169 | 0.050* | 0.025 |
| 194 L | 0.148 | .164* | 0.048* | 0.029 |
| 209 L | 0.178 | .176 | 0.045* | 0.027 |

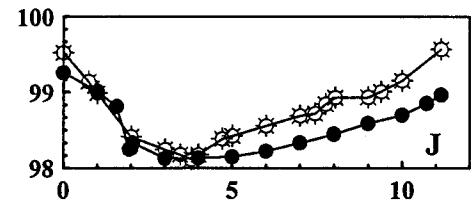
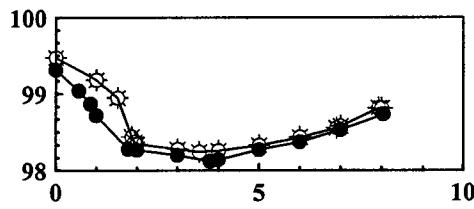
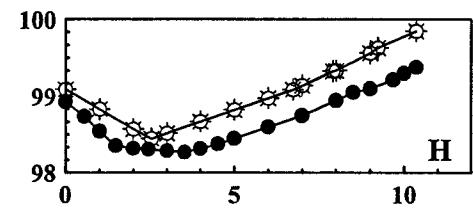
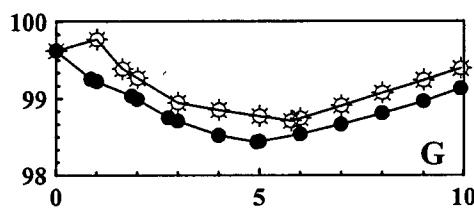
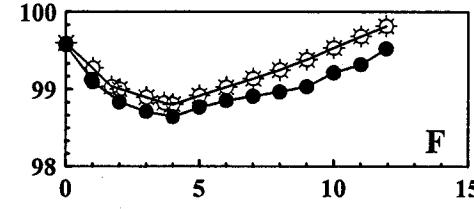
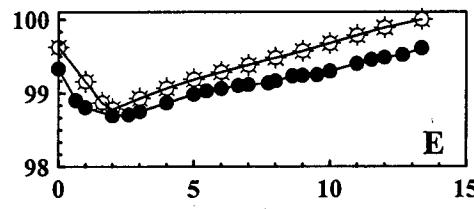
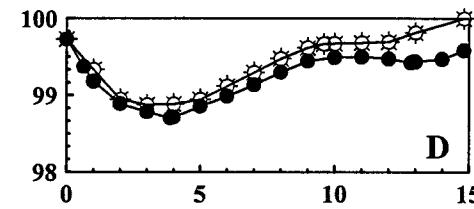
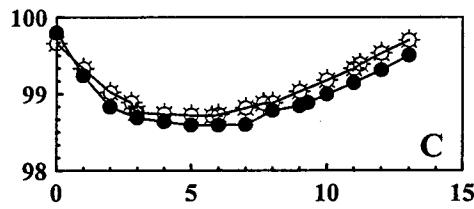
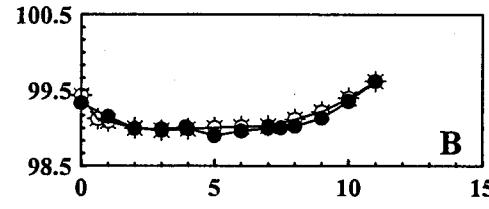
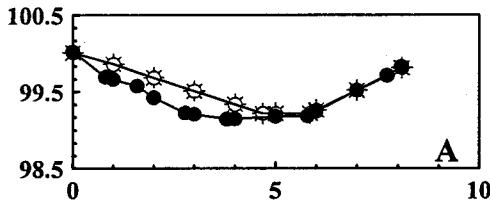
Table 9. Elevation changes along transects in 8 Interim Flows marsh transect sampling sites. The paired t test statistic is based on transect means. The site at 71 L (Cardenas Marsh) was not surveyed after the flood, so no tests were run for that site.

| Site | # Transects | Mean (Post - Pre) | t statistic | Probability |
|-------|-------------|-------------------|-------------|-------------|
| 43 L | 10 | 0.202 | 6.45 | < 0.0001 |
| 51 L | 10 | 0.216 | 4.43 | < 0.0001 |
| 55 R | 22 | 0.016 | 0.09 | N.S. |
| 72 L | N/R | N/R | N/R | N/R |
| 123 L | 4 | -0.229 | -0.65 | N.S. |
| 172 L | 9 | 0.372 | 4.98 | < 0.001 |
| 194 L | 15 | 0.115 | 2.87 | < 0.01 |
| 214 L | 6 | 0.169 | 1.28 | N.S. |

sediment in the marsh as a whole. At the other three sites, there was no significant overall change in the elevations of the transects. Table 9 lists the sites and the results of the paired t-tests across all transects within sites. In five of these sites a pattern emerged in which changes in transect elevation depended on its position within the site (Figures 8 through 14). In the marshes at 43.1 L, 51.4 L, 55.5 R, 172.1 L, and 194.1 L, transects which were closer to the mouths of the return channel (or further upstream) received the greatest amounts of deposition, and those closer to the head of the return channel had little or no deposition. This confirms a pattern described by the N.A.U. Sandbar Survey group in which areas at and upstream of the eddy separation point received larger amounts of sediment, and those below received less or actually were scoured (J.E. Hazel, N.A.U. Geology, personal communication). Also at the upstream end of sandbars, the bar itself migrated into the return channel, thus narrowing it and making it shallower. At the other two sites, 122.8 L and 213.6 L, no such pattern was detected. This is likely the result of these sites being extensively reworked during high flows (J. E. Hazel, N.A.U. Geology, personal communication). Copies of the marsh transect elevation data are attached as Appendix F of this report.

43 L

Elevation (local)

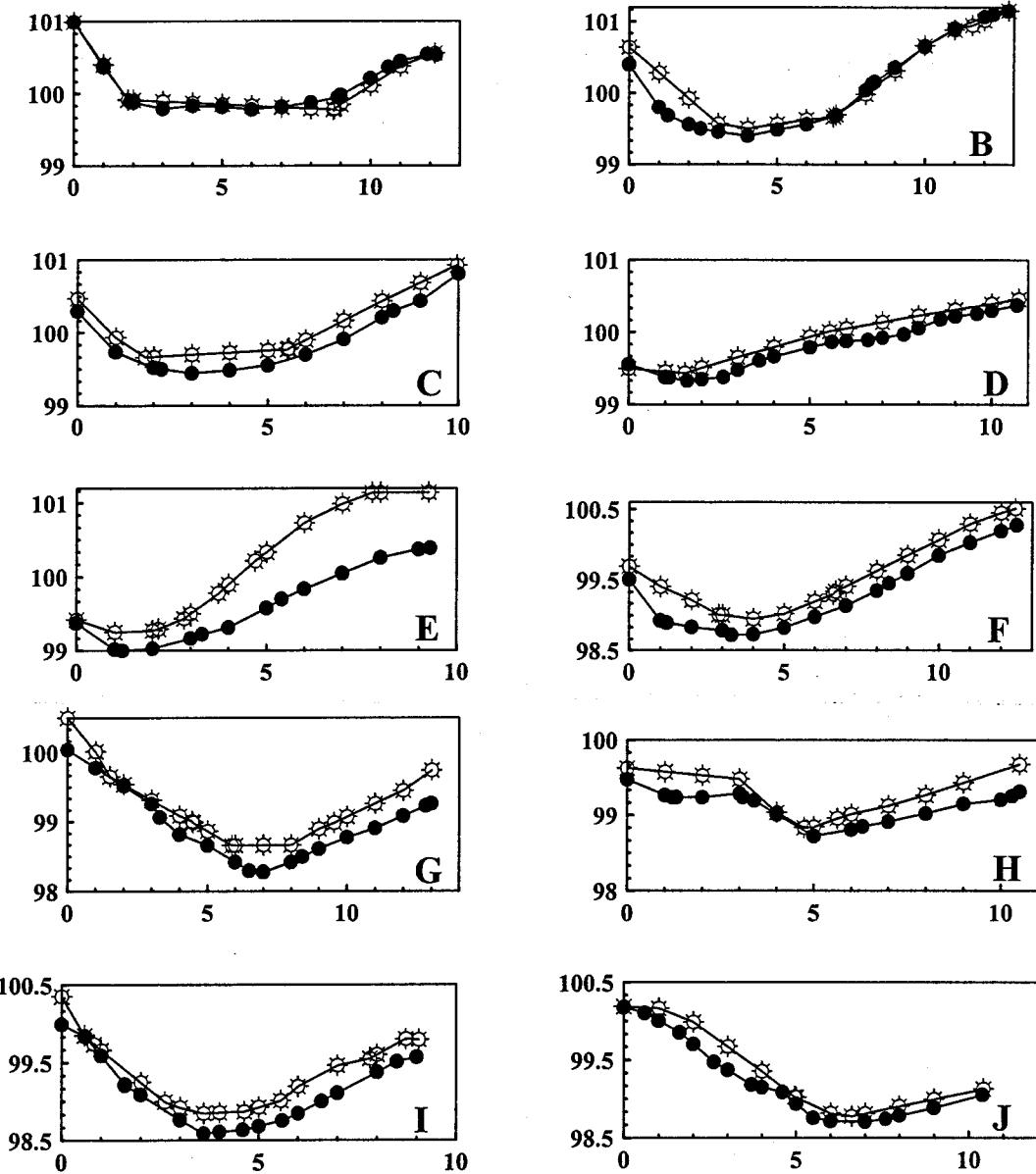


Distance from talus

Figure 8. Deposition of sediment on transects in the return-current channel marsh at 43.1 L. Closed circles represent pre-flood elevations relative to a local benchmark. Open circles represent post-flood conditions. Only transects A, B, and I show no significant deposition.

51 L

Elevation (local)



Distance from talus

Figure 9. Deposition of sediment on marsh transects in the return-current channel marsh at 51 L. Symbols are the same as Figure 8. Only transects A and B showed no significant effects of the flood.

55 R

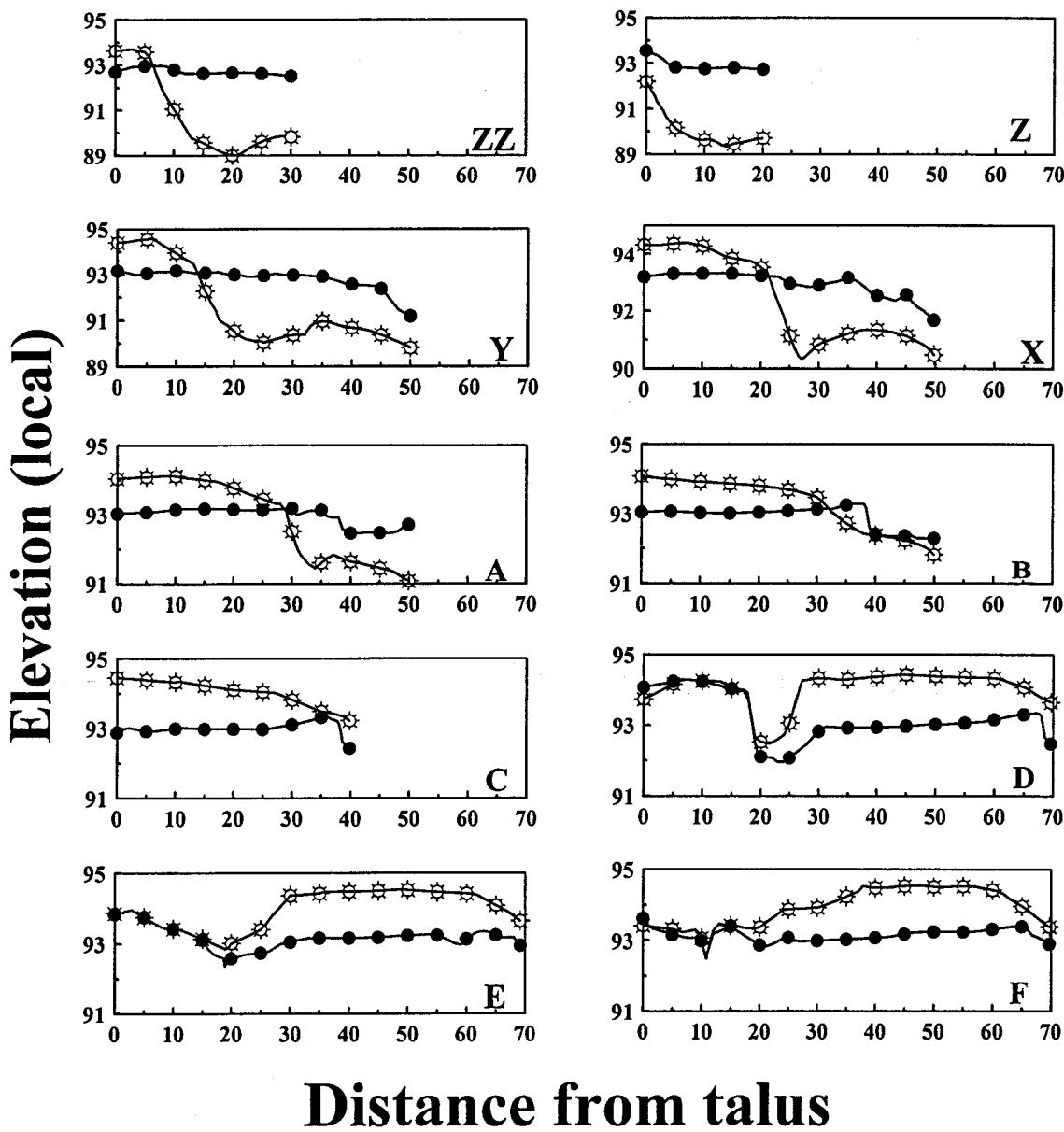


Figure 10. Deposition of sediment on the transects at the upstream end of the low sandbar marsh at 55.5 R. Graph 1 of 3. Symbols are as given in Figure 8. Only transects A and B showed no significant, consistent effects of the flood on sample point elevations, based on paired t-tests, although there were obvious effects of the flood on these transects.

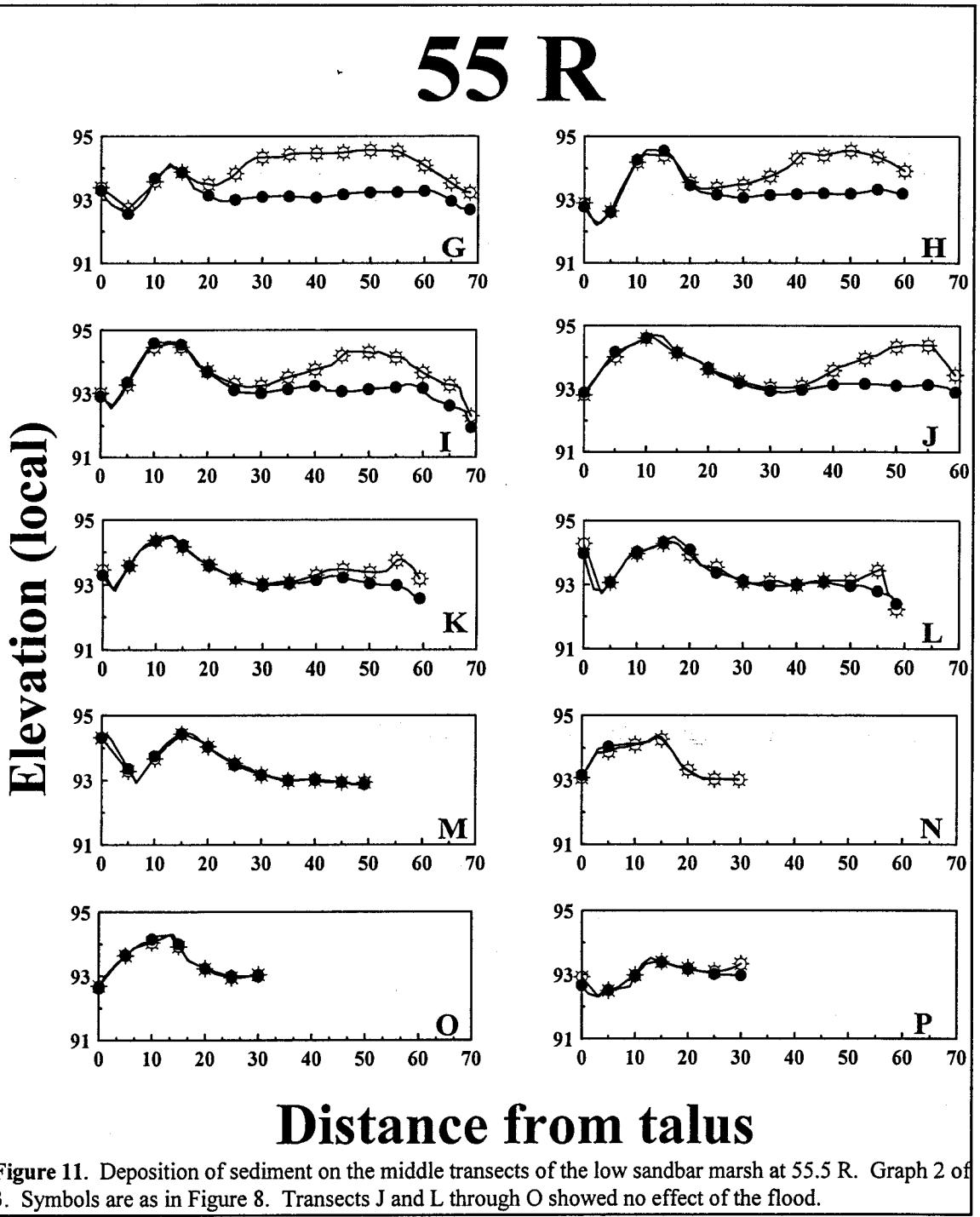
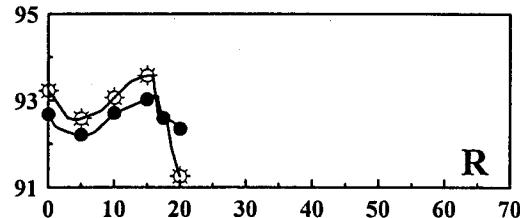
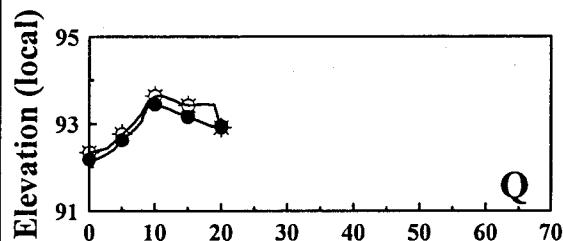


Figure 11. Deposition of sediment on the middle transects of the low sandbar marsh at 55.5 R. Graph 2 of 3. Symbols are as in Figure 8. Transects J and L through O showed no effect of the flood.

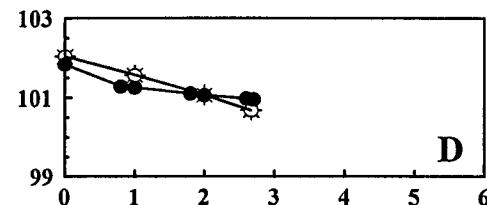
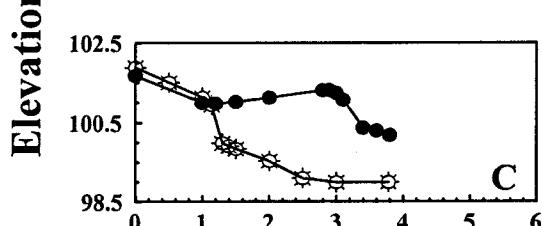
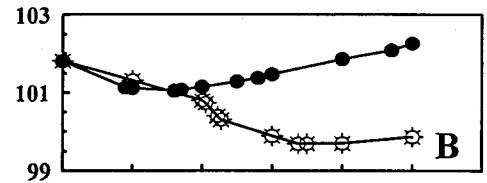
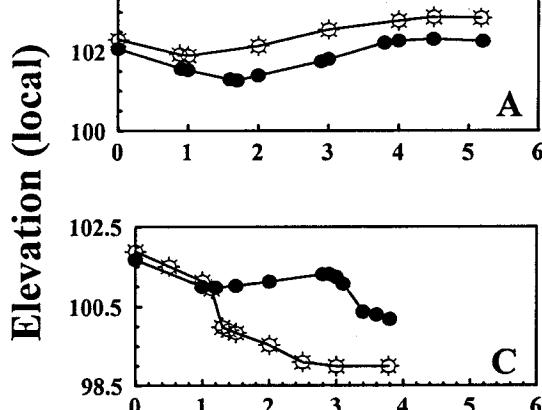
55 R



Distance from talus

Figure 12. Deposition of sediment on transects at the downstream end of the low sandbar marsh at 55 R. Graph 3 of 3. Symbols are the same as in Figure 8. Neither showed consistent, significant effects of the flood based on paired t-tests, although R shows obvious signs of significant erosion and deposition.

123 L



Distance from talus

Figure 13. Deposition of sediment on transects in the return-current channel marsh at 123 L. Symbols are as in Figure 8. Only transect A showed significant, consistent effects of the flood based on paired t-tests, although all transects showed some reworking.

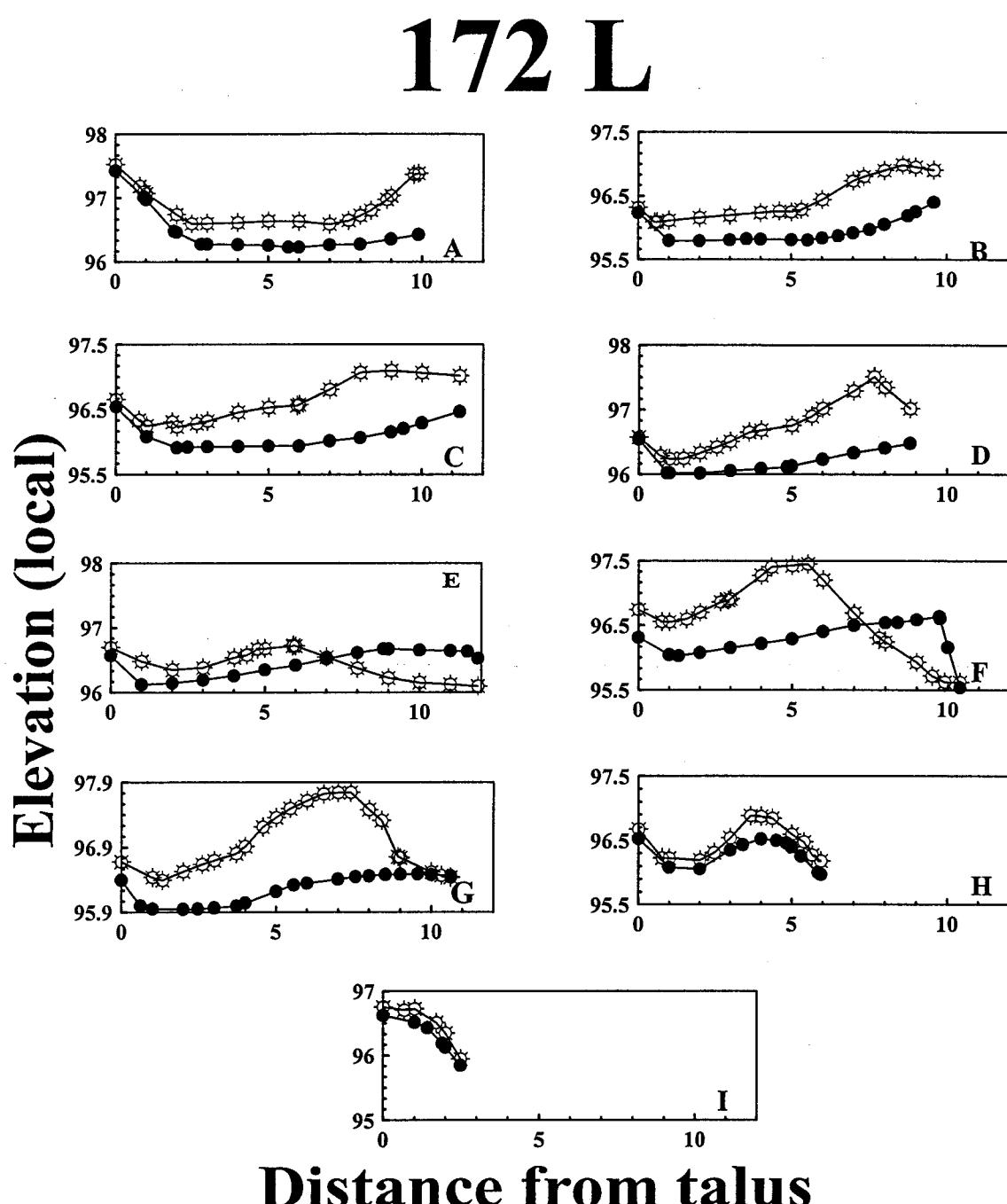
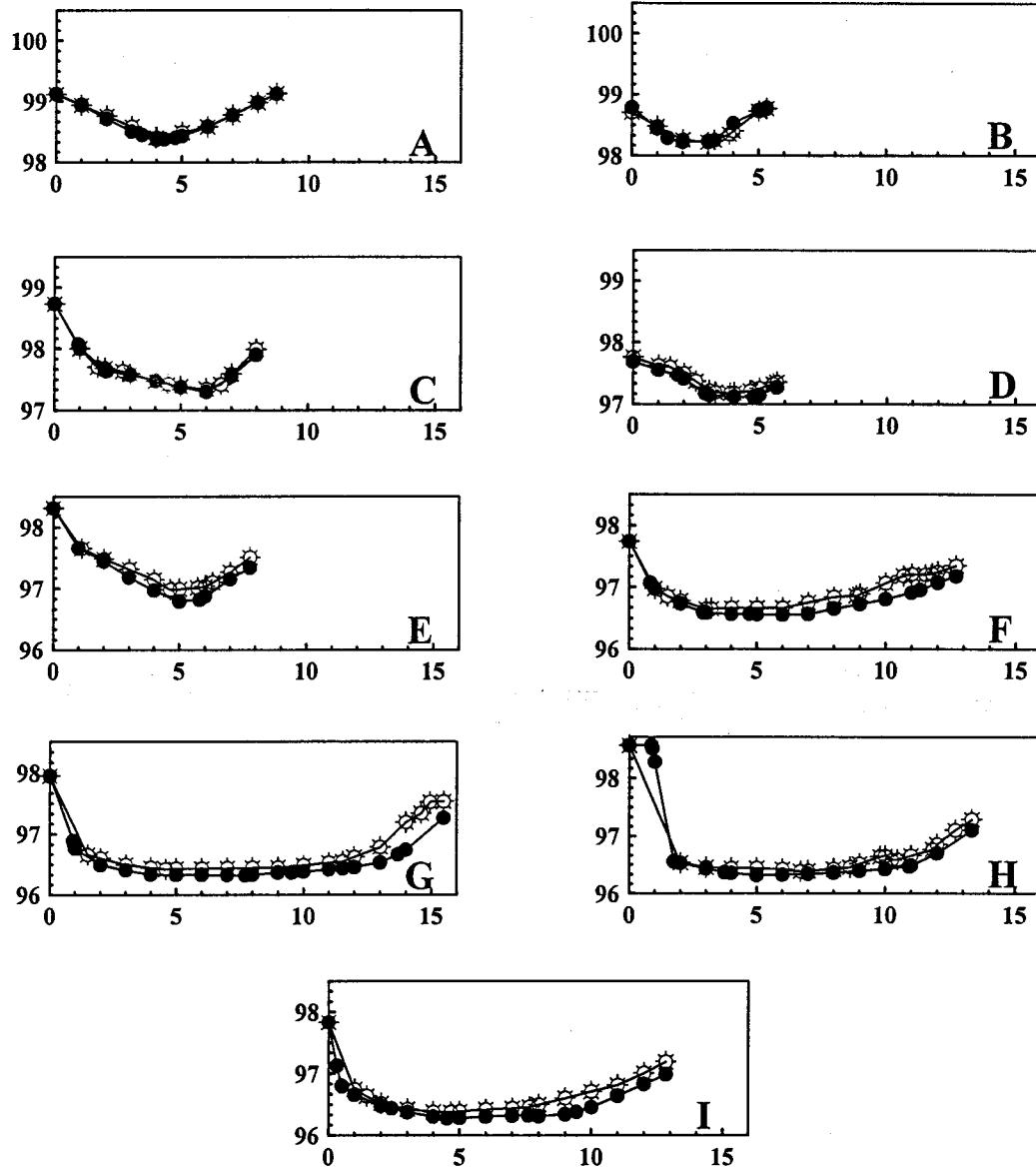


Figure 14. Deposition and erosion of sediment in transects in the return-current channel at 172 L. Symbols are as in figure 8. Only E and I showed no significant, consistent change based on a paired t-test, although E shows obvious signs of reworking.

194 L

Elevation (local)

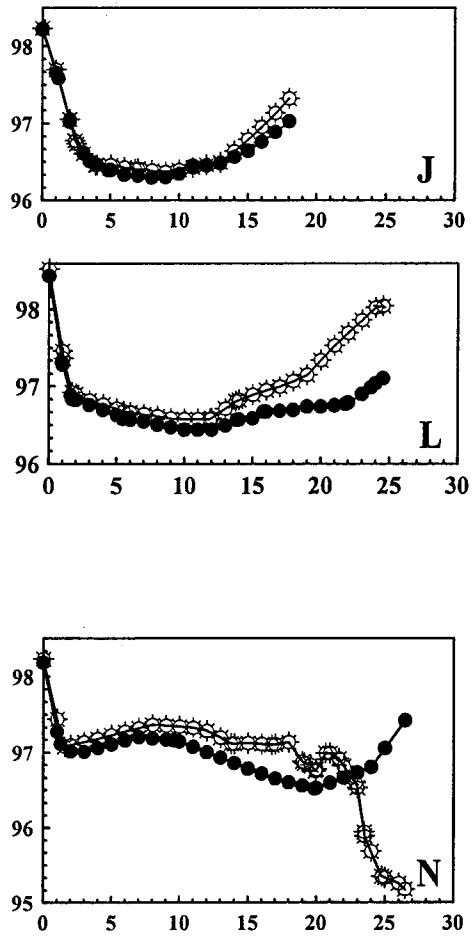


Distance from talus

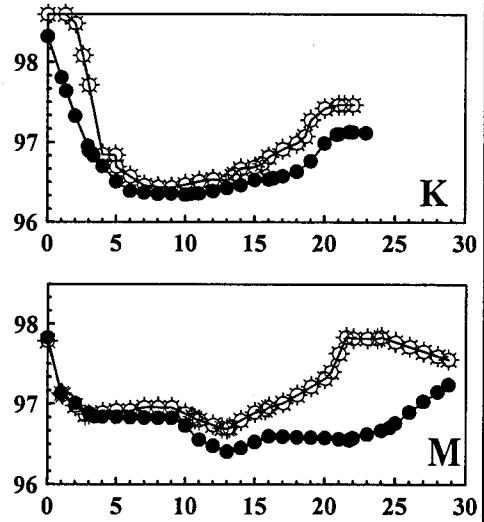
Figure 15. Deposition and erosion of sediment in transects in the return-current channel at 194 L. Graph 1 of 2. Symbols are as in Figure 8. Only transect B showed no significant, consistent effect of the flood based on paired t-tests.

194 L

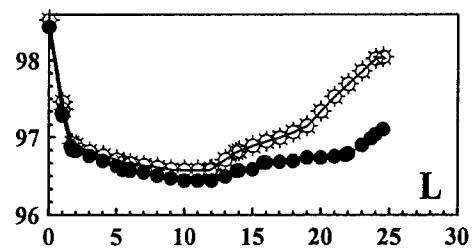
Elevation (local)



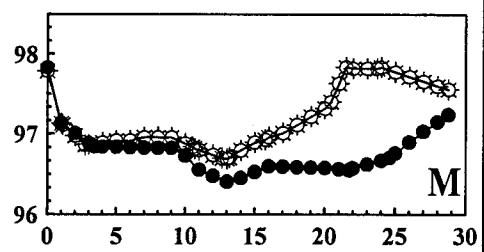
J



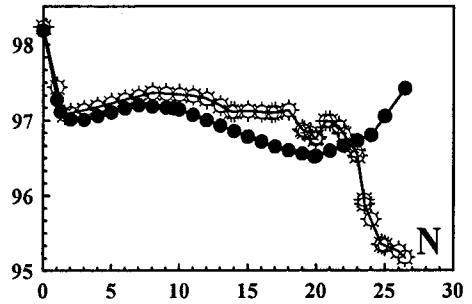
K



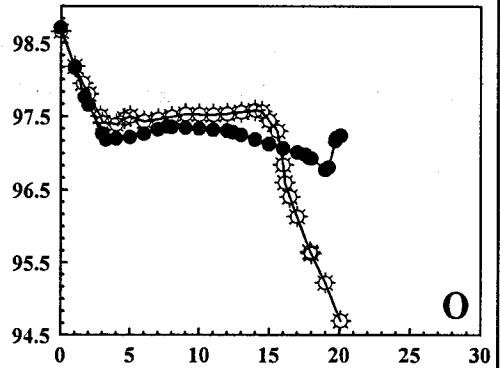
L



M



N

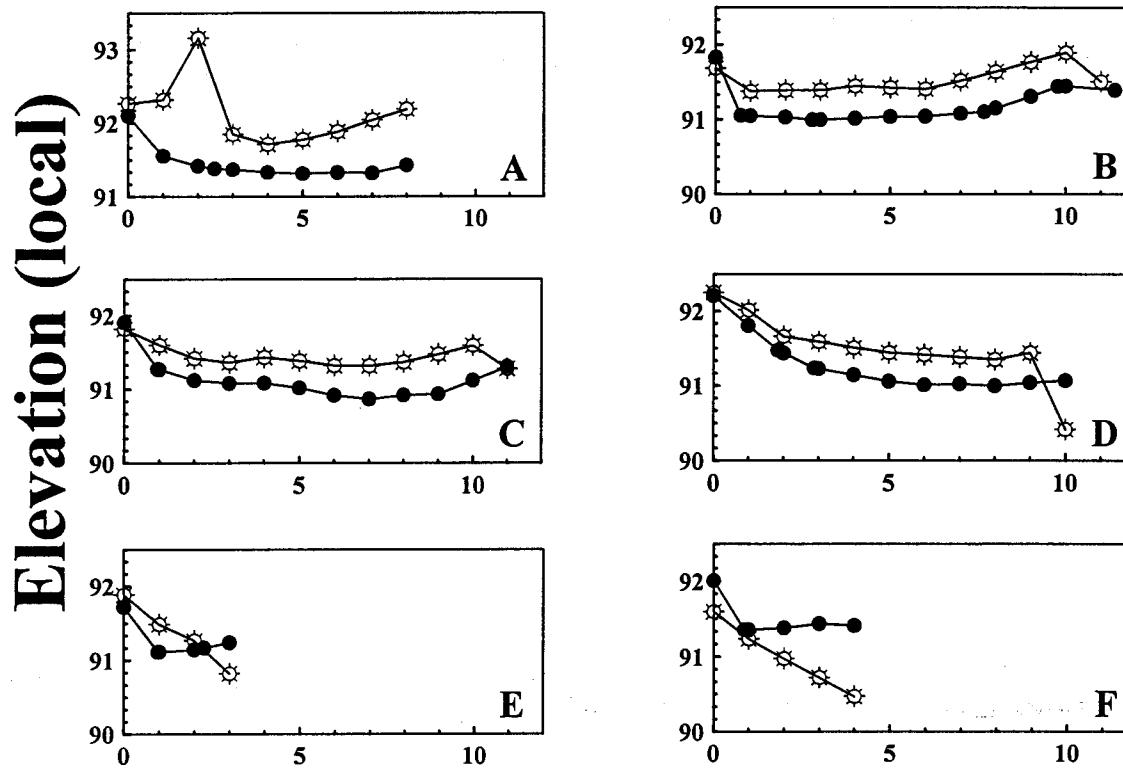


O

Distance from talus

Figure 16. Deposition and erosion of sediment in transects in the return-current channel at 194 L. Graph 2 of 2. Symbols are as in Figure 8. Only N and O showed no significant, consistent effect of the flood on the elevation of sample points, although both show obvious signs of sediment reworking.

214 L



Distance from talus

Figure 17. Deposition and erosion of sediment in the transects in the return-current channel marsh at 214 L. Symbols are as in Figure 8. Only E showed no significant change based on a paired t-test, although there are obvious signs of reworking. Not all of the original transects E and F could be included in the analysis because 4 and 6 meters of their river-side ends were eroded by the flood, and no hydrographic survey was available.

DISCUSSION AND CONCLUSIONS

Here we have shown that the effects of the 1996 Beach / habitat building flows on riparian vegetation were minimal. The effects on wetland vegetation patches were neither significant within sites nor consistent among sites. The deposition of sediment during the high flows buried the lowest-growing species, grasses and small herbs, but this effect was either not great enough or long-lasting enough or both to reclassify most patches of vegetation as different types after the flood. Below, we discuss the implications of our results for future planned flood releases and the use of floods as management tools.

Flooding and Vegetation

One of the aims of the high flows was to physically remove vegetation from new high water zone areas of sandbars both to reopen heavily vegetated campsites and to simply reintroduce flood disturbance as a community organizing force in a place where it had historically played a dominant role (Bureau of Reclamation 1995). Our results and personal observations show that rather than removal of vegetation, much of it was buried. The fact that many of the species which defined our vegetation types were at least tolerant of burial, and some of which thrived after burial (especially *Typha*, *Phragmites*, and *Salix*), led to an almost undetectable effect on wetland vegetation in our sites.

In other systems, flooding events often have severe consequences for vegetation. Stromberg et al. (1993) described moderate to severe damage to vegetation on low sandbars as a result of a 10-year return flood. Johnson et al. (1989) explain that flooding has a major impact on the composition of riparian assemblages in the southwestern U.S. The fact that we did not see such strong effects is likely the result of the small size of the flood. Grand Canyon historically

saw flood flows in excess of 100 kcfs on an annual basis and, because it is geomorphically the same canyon it was before the construction of Glen Canyon Dam, this is the discharge we would expect to find necessary to have a significant effect on vegetation.

Flooding and Invasive Exotic Species

One of the concerns planners of this flood had was that invasive exotic plant species would be spread by the high flows and that newly opened habitats would be colonized by these species (D. Wegner, Ecosystem Management International, Flagstaff, AZ, personal communication). The fact that we did not show a major change in the distribution of the three exotics of concern, either within or among sites, indicates that the timing and other characteristics of the flood were such that no such spread took place. Another fact contributing to this pattern is the low numbers and limited distribution of the species in the seed bank before the flood. Although our soil sample volumes were well above minimums prescribed for estimating seed banks (approximately 1000 cm³ versus 450 cm³; Gross 1990), we found very few in our samples. Although a much more extensive sampling effort may have turned up more individuals of these species, we doubt that the extra time and expense incurred would have been justified by any increase we might have found.

There was anecdotal evidence from fishing guides in Glen Canyon that the flood had caused the spread of tamarisk seedlings. Because we saw only 1 tamarisk seedling in all of our post-flood samples, and few seedlings in our censuses six months after the flood, we believe that seedling establishment was most likely the result of the summer-long high flows and local seed production. We count the lack of spread of tamarisk by the flood to be a major success of the design and timing of the flood. Other anecdotal evidence exists for the spread of camel thorn,

Alhagi camelorum, as a result of the flood (personal observations and M. Yeatts, Hopi Tribe, personal communication). Again, because we saw few *A. camelorum* seeds in post-flood samples, we attribute this spread to high near-constant summer flows providing a high, consistent water table which enhanced germination.

One of the major effects we documented in this study was the burial of the seed bank by new sediment. Although they were not physically removed from the system by scour, the seeds will likely become inviable rather quickly. Many authors have reported that some seeds can be very long-lived in the soil (Oosting and Humphreys 1940, Keddy and Reznicek 1982 and reviews in Murdoch and Ellis 1992). However if, as we suspect, the seed bank is predominantly a transient one (Type I of Thompson and Grime 1979), seeds in it can be expected to rapidly lose viability. Thus, although they are still present, they will not contribute to the regeneration of these sites.

We should point out that given the nature of Type I seed banks (Thompson and Grime 1979), we would advise caution in interpreting our seed bank results too quickly. Transient seed banks are depleted rather quickly and must be renewed on an annual basis. For this study, we measured seed numbers and species diversity in February and again in mid-May of 1996. Viable seeds may have been present in the soil after the flood, but we did not detect them because 1) they had germinated and died between the time the flood ended and when we made our collections, or 2) the cues and releasing factors for germination present before the February collections no longer had an effect in mid-May. A more appropriate comparison would thus be between collections made at the same time in successive years. We have collected seed soils in 1997 as part of the 1997 high flows contingency studies and will be able to make those

comparisons when that study is finished.

Flooding and Litter

As with the effects of the flood on vegetation, we found little effect on leaf litter.

Although three sites lost significant amounts of litter, most sites showed non-significant changes, both positive and negative (Figure 1). This variability in outcome is consistent with other reports in which there is no consensus on the effects of flooding on leaf litter (reviewed in Malanson 1993). Depending on many factors, including the number and severity of floods relative to historical levels, flooding may not remove leaf litter from sites (Molles et al. 1995).

We assume that the lack of an effect on leaf litter is a result of the high flows being insufficiently strong to cause transport out of our sites. Alternatively, riparian areas can be very productive and do produce large amounts of leaf litter (Malanson 1993 pp. 166-168). Thus part of the lack of an effect may be the result of higher than normal productivity brought on by a pulse of high water and the high constant flows in the summer which followed the flood. We would predict that higher flows would have led to the removal of more litter from our sites, though. Another possibility is that because our study sites are in high-flows eddy zones, any transport of litter out of the site may have been balanced by the trapping of litter and debris by the eddies, even with the burial of much of the organic matter by sand.

The fate of organic debris during this flood may have important implications for future flood designs. Casual observations that litter and debris were buried under sand along with vegetation (personal observations, and D. Ruben, USGS, Menlo Park, CA personal communication) is of some interest. It indicates that even those sites where our measures showed a loss of litter may not have actually lost the nutrients contained in the litter to in-stream

sinks. Rather, much of the carbon and nitrogen may have been effectively "banked" under the new deposits of sand, thus slowing their entry into aquatic nutrient spirals. Thus if future floods are planned for higher levels, at which plants and organic material are completely pulled out, consideration should be given to limiting the duration of the floods in the interests of preventing the loss of the material from the system.

Flooding and Substrates

The homogenization rather than overall coarsening of the substrates within sites was an unexpected result. A previous study on the effects of high flow events had concluded that the main effect on substrates was the coarsening of soils in their study site (Stevens and Waring 1986). In that study, no mention was made of the level of variability in soil texture before or after the flood.

The duration of the experimental high flows may have had an impact on the pattern of change in soil texture. The high flows of 1983 / 1984 lasted much longer than the 10 days of the experimental flood reported on here. D. Ruben (U.S.G.S. Menlo Park, CA, personal communication) says that the mean particle size in suspension in the water column is positively correlated with the time since high flows began. In other words, the longer it has been since high flows started, the coarser is the average particle being carried. Thus a longer experimental flood may have produced results more similar to those reported in earlier work.

The effects on seed germination of particle size and its correlates, nutrients and moisture holding capacity, thus have implications for future high flow designs. In general, riparian species have higher germination success in finer, moister, more nutrient-laden soils (Horton et al. 1960). Thus future floods should be planned for shorter durations, if rapid recovery of riparian

vegetation is a priority. Otherwise, the recovery of soil variability, especially in terms of the presence of fine soils will likely depend on higher flows concurrent with fine sediment inputs from tributaries. This would allow the opportunity for the deposition of fines in return current channels and other slack-water areas.

The deposition of coarse sediment in return-current channels was also an unexpected result. Although deposition of sand was one of the expectations of the flood flows (Bureau of Reclamation 1995), it was expected that return current channels would be reactivated and opened up to the main channel. Instead, sand was pushed out of the main channel, across the upstream end of reattachment bars, and into return current channels where it remained (J.E. Hazel, N. A.U. Department of Geology, Flagstaff, AZ, personal communication). This effectively buried much of the wetland vegetation in our study sites. However, because many of these species were tolerant of burial, especially species of *Salix*, *Carex*, *Typha*, *Phragmites*, and *Juncus*, many of these patches had recovered enough within six months to be classified again as a wetland patch in 1996.

MANAGEMENT RECOMMENDATIONS

We believe that the use of flooding as a management tool is good practice. For many of the resources in Grand Canyon, including vegetation, native fauna and sandbar dynamics, flooding was a primary organizing force before the construction of Glen Canyon Dam. Annual spring floods on the order of 100 kcfs tore up vegetation, distributed and reworked sediment, and shaped habitats for native fish and their food base. Therefore, the reintroduction of this force is a good idea, especially in a place where one of the stated management goals is to, "restore altered

ecosystems to their natural conditions" (U.S. Department of the Interior 1995).

We expect that the timing of future flows will be dependent mostly on considerations other than vegetation. Adequate levels of water behind Glen Canyon Dam and sediment in the main channel of the Colorado River within the Park will need to be present for future floods to be successful. Within these constraints, however, we would recommend that high flows be released at approximately the same time of year as the 1996 flows. We attribute the lack of spread of tamarisk and other exotics of concern to the fact that the flood was run at a time when viable seeds of these species were not being dispersed. Additionally, adults of many of the important riparian and wetland species, including species of *Carex*, *Juncus* *Equisetum*, *Typha*, and *Phragmites*, are dormant at this time of year and thus do not lose active above-ground parts when scouring occurs.

We would recommend changes to the hydrograph of the flood, however. First, given the minimal effect of the 45 kcfs flood reported on here, we would recommend increasing the maximum level of the flood discharge. If releasing 75 - 90 kcfs were politically and economically feasible during the next beach / habitat building flows, we believe that this would have the desired effect of removing new high water vegetation and allowing primary succession to occur. In our conversations with long-time river guides who experienced the 1983 / 1984 high flows and saw the conditions which immediately followed, the consensus has been that a flood of that magnitude would be necessary to remove significant amounts of the vegetation which has accumulated on and near sandbars since then. Second, we would recommend decreasing the duration of the high flows. Fine sediments, which are associated with nutrient-rich soils, were removed from the system early in this flood (D. Ruben, U.S.G.S. Menlo Park, CA, personal

communication). Fortunately for the sake of the aquatic and terrestrial nutrient spirals in this system, much of the organic matter which had been accumulating on sandbars and in return current channels was buried by the 45 kcfs flows and therefore "banked" in the system. If we use as a given that the goals of the next flood will be to remove riparian vegetation from near-shore habitats, but also to avoid entirely impoverishing them organically, we would recommend that the duration of the flood be kept as short as possible given its other goals. Otherwise, we predict that most nutrients currently in terrestrial riparian habitats will be flushed into Lake Mead.

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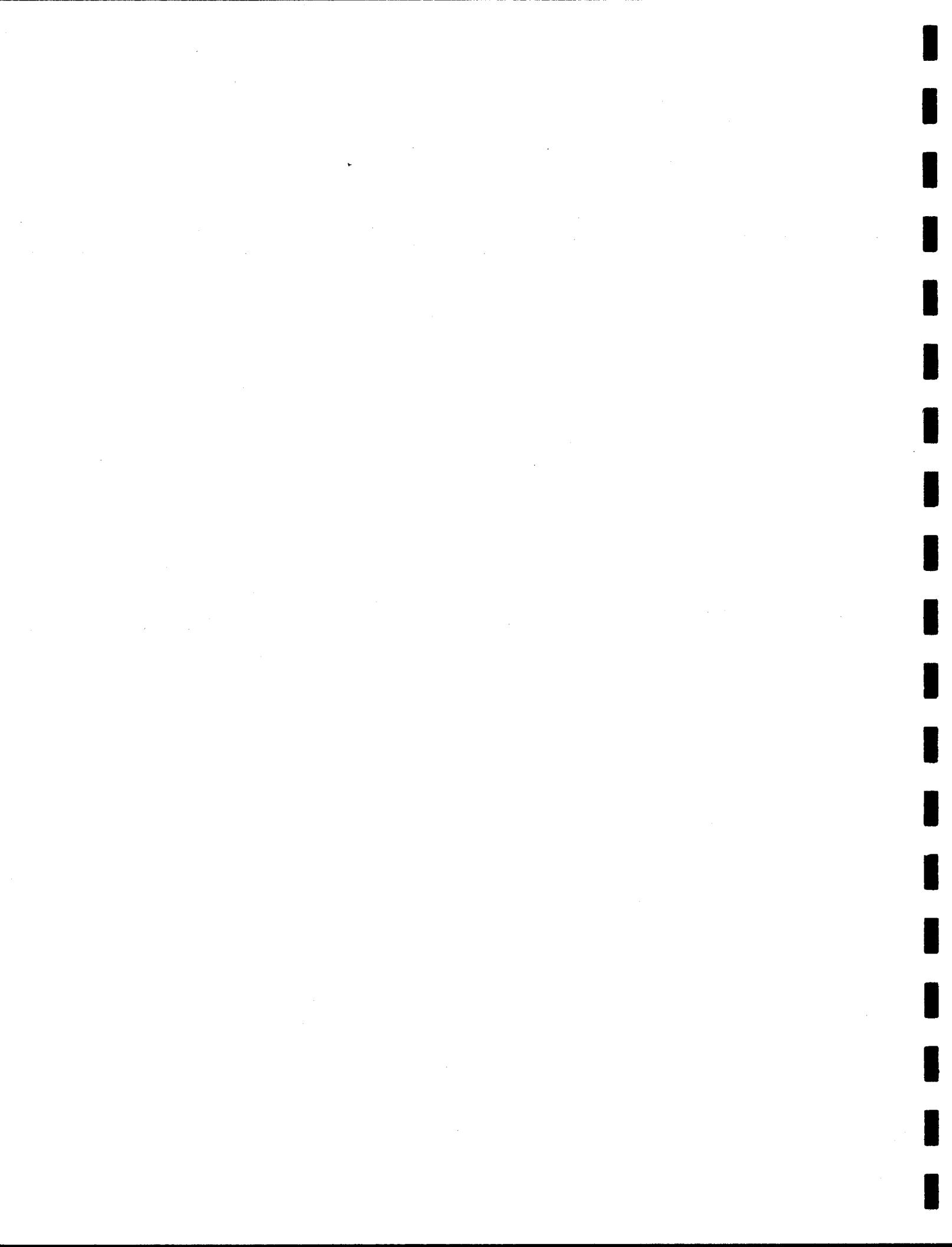
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Appendix A

Glossary of Acronyms for Plant Species Encountered During This Project

The acronyms we used during the course of this study are listed alphabetically, together with the corresponding generic and specific names. The taxonomy used for this study is from Kartesz and Kartesz (1994).

| Acronym | Species | | |
|----------|---------------------------------|---------|------------------------------------|
| ABEL | <i>Abronia elliptica</i> | BRWI | <i>Bromus wildenowii</i> |
| ABUTIL | <i>Abutilon sp.</i> | CAAQ | <i>Carex aquatilis</i> |
| ACGR | <i>Acacia greggii</i> | CAMU | <i>Camissonia multijuga</i> |
| ACWR | <i>Acourtia wrightii</i> | CECA | <i>Centaurium calycosum</i> |
| AGROSTIS | <i>Agrostis sp.</i> | CEEX | <i>Centaurium exaltatum</i> |
| AGSE | <i>Agrostis semiverticilata</i> | CEIN | <i>Cenchrus insertus</i> |
| AGSM | <i>Agropyron smithii</i> | CERE | <i>Celtis reticulata</i> |
| AGST | <i>Agrostis stolonifera</i> | CHAL | <i>Chenopodium album</i> |
| ALCA | <i>Alhagi camelorum</i> | CHNI | <i>Corispermum nitidum</i> |
| ALIN | <i>Allionia incarnata</i> | CHPA | <i>Chrysothamnus paniculatus</i> |
| AMAC | <i>Ambrosia acanthicarpa</i> | CHVI | <i>Chrysothamnus viscidiflorus</i> |
| AMFI | <i>Amaranthus fimbriatus</i> | COCA | <i>Conyza canadensis</i> |
| AMPO | <i>Amaranthus powellii</i> | CRBA | <i>Cryptantha barbigera</i> |
| ANGL | <i>Andropogon glomeratus</i> | CRYPTAN | <i>Cryptantha sp.</i> |
| APCA | <i>Apocynum cannabinum</i> | CYDA | <i>Cynodon dactylon</i> |
| APGR | <i>Apium graveolens</i> | CYER | <i>Cyperus erythrorhizos</i> |
| ARDR | <i>Artemesia dracunculus</i> | DAMO | <i>Dalea mollis</i> |
| ARFR | <i>Artemesia frigida</i> | DASE | <i>Dalea searlsiae</i> |
| ARGL | <i>Aristida glauca</i> | DAWR | <i>Datura wrightii</i> |
| ARLU | <i>Artemesia ludoviciana</i> | DICA | <i>Dicoria canescens</i> |
| ASSP | <i>Aster spinosus</i> | DICORIA | <i>Dicoria sp.</i> |
| ASSU | <i>Aster subulatus</i> | DISA | <i>Digitaria sanguinalis</i> |
| ASTRAG | <i>Astragalus sp.</i> | DISP | <i>Distichlis spicata</i> |
| ATCA | <i>Atriplex canescens</i> | DYPE | <i>Dysodia pentachaeta</i> |
| BAEM | <i>Baccharis emoryi</i> | ECCR | <i>Echinochloa crusgalli</i> |
| BAHY | <i>Bassia hyssopifolia</i> | ELCA | <i>Elymus canadensis</i> |
| BASA | <i>Baccharis sarothroides</i> | ELEOCH | <i>Eleocharis sp.</i> |
| BASE | <i>Baccharis sergiloides</i> | ELST | <i>Eleocharis rostellata</i> |
| BASL | <i>Baccharis salicifolia</i> | ENCELIA | <i>Encelia sp.</i> |
| BEJU | <i>Bebbia juncea</i> | ENFA | <i>Encelia farinosa</i> |
| BIFR | <i>Bidens frondosa</i> | ENFR | <i>Encelia virginensis</i> |
| BOBA | <i>Bothriochloa barbanodis</i> | EPAD | <i>Epilobium adenocaulon</i> |
| BOBR | <i>Bouteloua barbata</i> | EPNE | <i>Ephedra nevadensis</i> |
| BRCA | <i>Brickellia californica</i> | EQAR | <i>Equisetum arvense</i> |
| BRJA | <i>Bromus japonicus</i> | EQFE | <i>Equisetum x ferrissii</i> |
| BRLN | <i>Brickellia longifolia</i> | ERCI | <i>Eragrostis ciliaris</i> |
| BROMUS | <i>Bromus sp.</i> | ERCU | <i>Eragrostis curvula</i> |
| BRRI | <i>Bromus rigidus</i> | ERDE | <i>Eriogonum deflexum</i> |
| BRRU | <i>Bromus rubens</i> | ERDI | <i>Erigeron divergens</i> |
| BRTE | <i>Bromus tectorum</i> | ERIGER | <i>Erigeron sp.</i> |

| Acronym | Species | | |
|----------|--------------------------------------|---------|---------------------------------|
| ERIGERON | <i>Erigeron</i> sp. | MEAR | <i>Mentha arvense</i> |
| ERIN | <i>Eriogonum inflatum</i> | MELIL | <i>Melilotus</i> sp. |
| ERIOG | <i>Eriogonum</i> sp. | MENTZEL | <i>Mentzelia</i> sp. |
| ERLO | <i>Erigeron lobatus</i> | MUAS | <i>Muhlenbergia asperifolia</i> |
| ERPE | <i>Eriagrostis pectinacea</i> | MURI | <i>Muhlenbergia rigens</i> |
| ERPU | <i>Erioneuron pulchellum</i> | NAOF | <i>Nasturtium officinale</i> |
| EUPA | <i>Euphorbia palmeri</i> | NITR | <i>Nicotiana trigonophylla</i> |
| EUPHORB | Unknown Euphorbiaceae | OEHO | <i>Oenothera elata</i> |
| FAPA | <i>Fallugia paradoxa</i> | OEPA | <i>Oenothera pallida</i> |
| FEAR | <i>Festuca arundinacea</i> | OPPH | <i>Opuntia phaeacantha</i> |
| FEPR | <i>Festuca pratensis</i> | OPUNTIA | <i>Opuntia</i> sp. |
| FESTUCA | <i>Festuca</i> sp. | ORHY | <i>Oryzopsis hymenoides</i> |
| GAST | <i>Galium stellatum</i> | PACA | <i>Panicum capillare</i> |
| GNCH | <i>Gnaphalium stramineum</i> | PADI | <i>Paspalum dilatatum</i> |
| GRASS | Unknown grass | PAFI | <i>Parryella filifolia</i> |
| GUMI | <i>Gutierrezia microcephala</i> | PAIN | <i>Parthenium incanum</i> |
| GUSA | <i>Gutierrezia sarothrae</i> | PAVI | <i>Panicum virgatum</i> |
| GUTI | <i>Gutierrezia</i> sp. | PHAU | <i>Phragmites australis</i> |
| GUTIERRZ | <i>Gutierrezia</i> sp. | PLANTAG | <i>Plantago</i> sp. |
| HAAC | <i>Isocoma acradenia</i> | PLLA | <i>Plantago lanceolata</i> |
| HEAN | <i>Helianthus annuus</i> | PLMA | <i>Plantago major</i> |
| HECU | <i>Heliotropium curassavicum</i> | PLPA | <i>Plantago patagonica</i> |
| HEOB | <i>Hedeoma oblongifolium</i> | PLPU | <i>Pluchea purpureascens</i> |
| HEVI | <i>Heterotheca villosa</i> | POA | <i>Poa</i> sp. |
| HILARIA | <i>Hilaria</i> sp. | POAN | <i>Poa annua</i> |
| HIRI | <i>Hilaria rigida</i> | POFE | <i>Populus fremontii</i> |
| HOJU | <i>Hordeum murinum</i> | POGR | <i>Porophyllum gracile</i> |
| IMBR | <i>Imperata brevifolia</i> | POMO | <i>Polypogon monspeliensis</i> |
| ISAC | <i>Isocoma acradenia</i> | PRGL | <i>Prosopis glandulosa</i> |
| JUAR | <i>Juncus articulatus</i> | RACY | <i>Ranunculus cymbalaria</i> |
| JUBA | <i>Juncus balticus</i> | RHTR | <i>Rhus trilobata</i> |
| JUEN | <i>Juncus ensifolius</i> | RUMEX | <i>Rumex</i> sp. |
| JULO | <i>Juncus longistylus</i> | SACY | <i>Sarcostemma cynanchoides</i> |
| JUTO | <i>Juncus torreyi</i> | SAEX | <i>Salix exigua</i> |
| LACTUCA | <i>Lactuca</i> sp. | SAGO | <i>Salix goodingii</i> |
| LEFR | <i>Lepidium fremontii</i> | SAIB | <i>Salsola iberica</i> |
| LELA | <i>Lepidium latifolium</i> | SARA | <i>Saccharum ravennae</i> |
| LEMO | <i>Lepidium montanum</i> | SCAC | <i>Scirpus acutus</i> |
| LEPTOC | <i>Leptochloa</i> sp. | SCMA | <i>Scirpus maritimus</i> |
| MAAN | <i>Maurandya antirrhini</i> flora | SCMI | <i>Scirpus microcarpus</i> |
| MAPI | <i>Machaeranthera pinnatifida</i> | SCPUS | <i>Scirpus pungens</i> |
| | | SCSC | <i>Schizachyrium scoparium</i> |

| Acronym | Species |
|----------|------------------------------------|
| SCVA | <i>Scirpus tabernaemontani</i> |
| SETARIA | <i>Setaria sp.</i> |
| SIHY | <i>Elymus elymoides</i> |
| SOAS | <i>Sonchus asper</i> |
| SOLANUM | <i>Solanum sp.</i> |
| SOLIDAG | <i>Solidago sp.</i> |
| SOLIDAGO | <i>Solidago sp.</i> |
| SONCHUS | <i>Sonchus sp.</i> |
| SOOC | <i>Solidago occidentalis</i> |
| SPAI | <i>Sporobolus airoides</i> |
| SPAM | <i>Sphaeralcea ambigua</i> |
| SPCO | <i>Sporobolus contractus</i> |
| SPCR | <i>Sporobolus cryptandrus</i> |
| SPFL | <i>Sporobolus flexuosus</i> |
| SPGI | <i>Sporobolus giganteus</i> |
| SPHAER | <i>Sphaeralcea sp.</i> |
| SPOROB | <i>Sporobolus sp.</i> |
| STPA | <i>Stephanomeria pauciflora</i> |
| STPI | <i>Stanleya pinnata</i> |
| STSP | <i>Stipa speciosa</i> |
| SUTO | <i>Suaeda torreyana</i> |
| TAOF | <i>Taraxacum officinale</i> |
| TARA | <i>Tamarix chinensis</i> |
| TESE | <i>Pluchea sericea</i> |
| TIDESTR | <i>Tidestromia sp.</i> |
| TILA | <i>Tiquilia latior</i> |
| TIQUILIA | <i>Tiquilia sp.</i> |
| TRDU | <i>Tragopogon dubius</i> |
| TRMU | <i>Tridens muticus</i> |
| TYDO | <i>Typha domingensis</i> |
| VEAM | <i>Veronica americana</i> |
| VEAN | <i>Veronica anagallis-aquatica</i> |
| VEBR | <i>Verbena bracteata</i> |
| VERONICA | <i>Veronica sp.</i> |
| VETH | <i>Verbascum thapsus</i> |
| VUOC | <i>Vulpia octoflora</i> |
| XAST | <i>Xanthium strumarium</i> |
| YUCCA | <i>Yucca sp.</i> |



Appendix B

Data from Damage Assessment Collected in May 1996

Data are for polygons in each of the nine monitoring sites. Data are grouped in tables by site. The last three digits of polygon names correspond to the polygon numbers ("vegno") in the GCMRC GIS (i.e. 043012 has data on the polygon with vegno = 12 at 43.1 L). The data columns are as follows:

POLYGON: A six-digit number of the form "MMMPPP" where "MMM" is a three-digit site identifier and "PPP" is a three-digit polygon identifier. For example, the polygon listed as 071016 contains data on polygon 16 from the sampling site at 71.4 L.

DAMAGE: A subjective assessment of damage to woody plants in the polygon on a scale of no damage (= 0) to severe damage (= 3). See text in the Methods section for details.

DEPOSIT: An estimate of the amount of deposition of new sediment in the polygon on a scale of no deposition (=0), 0 - 5 cm (= 1), 5 - 15 cm (= 2), and 15+ cm (= 3). See text in the Methods section for details.

SCOUR: An indicator of the occurrence of substrate and vegetation scour within the polygon, listed as either no scour (= 0) or scour (= 1).

ALGAE: An indicator of the presence of *Cladophora* algae cladding on plants in the plot, listed as either absent (= 0) or present (= 1).

DEBRIS: An indicator of the presence (= 1) or absence (= 0) of piles of debris washed up by the high flows.

DEPTH: An estimate of the depth of the mean depth, in meters, of water in the polygon at the highest flow level as indicated by the height difference between the post-flood soil surface and the highest piece of *Cladophora* algae in the polygon or adjacent polygons.
N/R = data not recorded.

NOTES: Field notes of unusual conditions.

Polygon Damage Assessment
Site: 43 L

May 1997

| Polygon | Damage | Deposit | Scour | Algae | Debris | Depth | Notes |
|---------|--------|---------|-------|-------|--------|-------|-----------|
| 043002 | 0 | 3 | 0 | 0 | 1 | N/R | |
| 043003 | 0 | 1 | 0 | 0 | 1 | N/R | |
| 043008 | 0 | 1 | 1 | 1 | 0 | N/R | |
| 043010 | 2 | 2 | 0 | 1 | 0 | N/R | |
| 043011 | 1 | 3 | 0 | 1 | 0 | N/R | |
| 043012 | 1 | 2 | 0 | 0 | 1 | N/R | |
| 043015 | 2 | 2 | 0 | 1 | 1 | N/R | |
| 043016 | 1 | 2 | 0 | 1 | 0 | N/R | |
| 043017 | 2 | 3 | 0 | 1 | 0 | N/R | |
| 043018 | 2 | 3 | 0 | 1 | 1 | N/R | |
| 043019 | 1 | 3 | 0 | 1 | 1 | N/R | |
| 043021 | 2 | 3 | 1 | 0 | 0 | N/R | |
| 043023 | 2 | 3 | 0 | 0 | 0 | N/R | |
| 043024 | 1 | 3 | 0 | 1 | 0 | N/R | |
| 043025 | 1 | 1 | 0 | 0 | 1 | N/R | |
| 043026 | 1 | 2 | 0 | 1 | 1 | N/R | |
| 043027 | 0 | 2 | 0 | 1 | 1 | N/R | |
| 043028 | 2 | 2 | 0 | 1 | 1 | N/R | |
| 043032 | 1 | 2 | 0 | 0 | 0 | N/R | |
| 043033 | | | | | | N/R | > 50 kcfs |
| 043037 | 2 | 2 | 0 | 0 | 0 | N/R | |
| 043038 | 0 | 3 | 0 | 0 | 0 | N/R | |
| 043039 | 0 | 1 | 0 | 0 | 0 | N/R | |
| 043041 | 1 | 2 | 0 | 0 | 0 | N/R | ERCU |
| 043043 | 3 | 3 | 1 | 0 | 0 | N/R | |
| 043044 | | | | | | N/R | > 50 kcfs |
| 043048 | 1 | 3 | 1 | 0 | 0 | N/R | |
| 043050 | 0 | 1 | 0 | 0 | 1 | N/R | |
| 043057 | 1 | 3 | 0 | 0 | 0 | N/R | |
| 043058 | 1 | 3 | 0 | 0 | 0 | N/R | |
| 043059 | 1 | 3 | 0 | 0 | 0 | N/R | |
| 043060 | 0 | 2 | 0 | 1 | 1 | N/R | |
| 043063 | 1 | 3 | 0 | 0 | 0 | N/R | |
| 043064 | 0 | 2 | 0 | 0 | 1 | N/R | |
| 043091 | 0 | 1 | 0 | 1 | 1 | N/R | |
| 043092 | | | | | | N/R | > 50 kcfs |

Polygon Damage Assessment
Site: 51 L

May 1997

| Polygon | Damage | Deposit | Scour | Algae | Debris | Depth | Notes |
|---------|--------|---------|-------|-------|--------|-------|---------------------------|
| 051002 | 1 | 2 | 0 | 0 | 0 | 1 | |
| 051003 | 1 | 1 | 0 | 0 | 1 | 1 | affected area only |
| 051007 | 1 | 2 | 0 | 0 | 0 | 1.8 | fine sand |
| 051009 | 2 | 2 | 0 | 1 | 1 | 0.7 | EQFE / SAEX flattened |
| 051012 | 1 | 1 | 0 | 0 | 1 | 1.6 | |
| 051013 | 2 | 3 | 0 | 0 | 1 | 0.2 | Some flattening, B. ring |
| 051019 | 2 | 3 | 0 | 1 | 0 | 1.2 | TARA / SAEX flat, strip |
| 051020 | 2 | 3 | 0 | 0 | 0 | 1.3 | TYDO, Juncus flattened |
| 051021 | 3 | 3 | 1 | 1 | 0 | 1.7 | Split plot in 2 parts now |
| 051022 | 1 | 2 | 0 | 0 | 0 | 1.8 | standing water |
| 051023 | 2 | 2 | 0 | 1 | 0 | 1.6 | PHAU flattened |
| 051024 | 2 | 3 | 0 | 0 | 0 | 1.6 | |
| 051025 | 2 | 3 | 0 | 0 | 0 | 1.6 | |
| 051026 | | | | | | | > 50 kcfs |
| 051027 | | | | | | | > 50 kcfs |
| 051029 | 1 | 3 | 0 | 0 | 0 | 1.5 | all duff gone |
| 051030 | 1 | 3 | 0 | 1 | 0 | 1 | |
| 051031 | 3 | 3 | 1 | 0 | 0 | 1 | no veg left |
| 051032 | 2 | 3 | 0 | 1 | 0 | 0.6 | TARA / BASL stripped |
| 051033 | 2 | 3 | 1 | 0 | 0 | 0.6 | a lot of scouring |
| 051034 | 2 | 3 | 0 | 0 | 0 | 0.2 | no plants visible |
| 051035 | 1 | 3 | 0 | 1 | 0 | 0.5 | "hilling" around plants |
| 051036 | 1 | 3 | 0 | 1 | 0 | 0.5 | "hilling" around plants |
| 051037 | | | | | | | > 50 kcfs |
| 051040 | 1 | 3 | 0 | 1 | 0 | 0.8 | |
| 051041 | 2 | 3 | 0 | 0 | 0 | 0.4 | all veg buried |
| 051042 | 1 | 3 | 0 | 0 | 0 | 20 | fine sand |
| 051043 | 2 | 3 | 0 | 0 | 0 | 1.6 | |
| 051044 | 1 | 3 | 0 | 0 | 0 | 0.1 | LELA present |
| 051045 | 2 | 3 | 0 | 0 | 0 | 1.2 | standing water |
| 051046 | 1 | 1 | 0 | 0 | 0 | 1.2 | 2 cm silt deposited |
| 051050 | 2 | 3 | 0 | 1 | 1 | 0.9 | woody debris |
| 051051 | 1 | 2 | 0 | 1 | 1 | 0.7 | fine sand |
| 051052 | | | | | | | > 50 kcfs |
| 051058 | | | | | | | Submerged |
| 051069 | 1 | 1 | 0 | 0 | 1 | 0.8 | Water, LELA, ERCU |
| 051070 | 1 | 1 | 0 | 0 | 0 | 1.7 | lots of LELA |
| 051071 | 3 | 0 | 0 | 0 | 0 | 0.1 | plants flattened |
| 051091 | 3 | 3 | 0 | 0 | 0 | 0.8 | plants flat and stripped |

Polygon Damage Assessment
Site: 55 R

May 1997

| Polygon | Damage | Deposit | Scour | Algae | Debris | Depth | Notes: |
|---------|--------|---------|-------|-------|--------|-------|----------------------------|
| 055001 | | | | | | | Submerged |
| 055002 | 1 | 1 | 1 | 0 | 1 | 0.2 | B.R. at lower edge of plot |
| 055010 | 1 | 3 | 0 | 1 | 0 | 1.1 | |
| 055011 | 1 | 3 | 0 | 1 | 0 | 0.8 | |
| 055012 | 1 | 1 | 0 | 0 | 0 | 1.9 | |
| 055013 | 0 | 1 | 1 | 0 | 0 | 0.5 | assessed lowest edge only |
| 055016 | 0 | 2 | 0 | 0 | 0 | 1.3 | standing water present |
| 055017 | 2 | 3 | 0 | 1 | 1 | 0.8 | |
| 055018 | 1 | 1 | 0 | 1 | 1 | 0.1 | |
| 055019 | 0 | 1 | 0 | 1 | 1 | 1.2 | |
| 055020 | 1 | 3 | 0 | 1 | 0 | 1.1 | heavy algae |
| 055021 | 1 | 2 | 0 | 1 | 1 | 0.8 | |
| 055023 | 2 | 3 | 0 | 1 | 0 | 0.3 | |
| 055024 | 2 | 3 | 0 | 1 | 0 | 0.3 | Phau buried |
| 055025 | 0 | 1 | 0 | 1 | 0 | 1.1 | |
| 055026 | 2 | 3 | 0 | 1 | 0 | 1.4 | |
| 055027 | 1 | 3 | 0 | 1 | 0 | 0.6 | |
| 055028 | 1 | 3 | 0 | 0 | 0 | 0.3 | |
| 055029 | 1 | 3 | 0 | 0 | 1 | 0.7 | |
| 055033 | 3 | 0 | 1 | 0 | 0 | | gone! |
| 055034 | 1 | 3 | 0 | 1 | 0 | 1 | heavy algae |
| 055035 | 3 | 0 | 1 | 0 | 0 | | gone! |
| 055036 | 3 | 0 | 1 | 0 | 0 | | gone! |
| 055037 | 3 | 0 | 1 | 0 | 0 | N/R | Tiny amount remains |
| 055038 | 1 | 3 | 0 | 1 | 0 | 1.3 | heavy algae |
| 055039 | 1 | 3 | 0 | 1 | 0 | 0.5 | heavy algae |
| 055040 | 1 | 3 | 0 | 1 | 0 | 0.5 | |
| 055045 | 1 | 1 | 0 | 0 | 0 | 0.2 | |
| 055047 | 1 | 1 | 0 | 0 | 0 | 1.5 | |
| 055048 | 1 | 1 | 0 | 0 | 1 | 0.3 | |
| 055049 | 0 | 3 | 0 | 0 | 1 | 1.2 | |
| 055050 | | | | | | | > 50 kcfs |
| 055055 | 2 | 3 | 0 | 1 | 1 | 0.5 | |
| 055056 | 0 | 1 | 0 | 1 | 1 | 0.5 | B.ring near lower edge |
| 055058 | 1 | 1 | 0 | 1 | 1 | 0.7 | affected areas only |
| 055059 | | | | | | | > 50 kcfs |
| 055070 | 3 | 1 | 1 | 0 | 0 | 1.5 | half polygon scoured |

Polygon Damage Assessment
Site: 68 R

May 1997

| Polygon | Damage | Deposit | Scour | Algae | Debris | Depth | Notes: |
|---------|--------|---------|-------|-------|--------|-------|---------------------|
| 068001 | 2 | 3 | 0 | 1 | 0 | 1.1 | |
| 068002 | 1 | 3 | 0 | 1 | 1 | 0.4 | |
| 068003 | 0 | 3 | 0 | 1 | 1 | 0.5 | |
| 068004 | | | | | | | >50 kcfs |
| 068006 | | | | | | | >50 kcfs |
| 068012 | | | | | | | >50 kcfs |
| 068019 | 2 | 3 | 1 | 1 | 0 | 0.7 | river half scoured |
| 068020 | 1 | 3 | 0 | 1 | 0 | 1.2 | |
| 068021 | 1 | 1 | 0 | 0 | 0 | 0.1 | |
| 068022 | 1 | 1 | 0 | 0 | 1 | 0.1 | |
| 068023 | 1 | 1 | 0 | 0 | 1 | 0.1 | affected area only |
| 068024 | 0 | 1 | 0 | 1 | 0 | 0.4 | |
| 068025 | | | | | | | >50 kcfs |
| 068026 | | | | | | | >50 kcfs |
| 068027 | | | | | | | >50 kcfs |
| 068028 | 0 | 1 | 0 | 0 | 0 | 0.1 | |
| 068029 | | | | | | | >50 kcfs |
| 068030 | | | | | | | >50 kcfs |
| 068031 | 2 | 3 | 0 | 1 | 1 | 1.1 | |
| 068032 | 3 | 3 | 0 | 1 | 1 | 0.2 | |
| 068033 | 1 | 1 | 0 | 1 | 0 | 0.9 | |
| 068034 | | | | | | | >50 kcfs |
| 068035 | 0 | 1 | 0 | 0 | 1 | 0.1 | |
| 068036 | 0 | 3 | 0 | 1 | 0 | 0.4 | |
| 068037 | | | | | | | >50 kcfs |
| 068038 | | | | | | | >50 kcfs |
| 068039 | 2 | 0 | 1 | 0 | 0 | 1.8 | heavy EQFE resprout |
| 068040 | 2 | 3 | 0 | 1 | 0 | 0.6 | heavy algae |
| 068041 | 0 | 1 | 0 | 1 | 1 | 0.3 | |
| 068042 | 1 | 1 | 1 | 1 | 1 | 0.5 | |
| 068043 | 0 | 1 | 0 | 1 | 0 | 0.1 | |
| 068044 | | | | | | | >50 kcfs |
| 068045 | 3 | 3 | 0 | 1 | 1 | 0.6 | |
| 068046 | 1 | 1 | 0 | 1 | 1 | 1.4 | |
| 068047 | 1 | 1 | 0 | 0 | 1 | | edge of high water |

Polygon Damage Assessment
Site: 71 L

May 1997

| Polygon | Damage | Deposit | Scour | Algae | Debris | Depth | Notes: |
|---------|--------|---------|-------|-------|--------|-------|------------------------|
| 071002 | 2 | 0 | 0 | 1 | 1 | 1.1 | |
| 071003 | 1 | 3 | 0 | 1 | 1 | 0.2 | |
| 071004 | | | | | | | > 50 kcfs |
| 071007 | 2 | 3 | 1 | 0 | 0 | 1.5 | |
| 071008 | 1 | 3 | 0 | 1 | 1 | 0.8 | |
| 071009 | 1 | 3 | 0 | 0 | 1 | 0.1 | |
| 071010 | 1 | 1 | 0 | 0 | 0 | 0.1 | |
| 071012 | | | | | | | > 50 kcfs |
| 071013 | | | | | | | > 50 kcfs |
| 071014 | | | | | | | > 50 kcfs |
| 071019 | 1 | 3 | 0 | 0 | 0 | 1.2 | |
| 071020 | 1 | 3 | 0 | 0 | 0 | 0.3 | |
| 071021 | 0 | 1 | 0 | 0 | 1 | 0.4 | |
| 071022 | 0 | 1 | 0 | 0 | 1 | 0.4 | riverside edge is B.R. |
| 071026 | 0 | 3 | 0 | 0 | 0 | 0.5 | |
| 071027 | 0 | 1 | 0 | 0 | 0 | 0.2 | finesand, duff removed |
| 071028 | 0 | 1 | 0 | 0 | 0 | 0.9 | silt / clay deposition |
| 071030 | 0 | 1 | 0 | 0 | 0 | 0.3 | duff moved |
| 071032 | 2 | 3 | 0 | 0 | 0 | 0.5 | PHAU flattened |
| 071033 | 2 | 3 | 0 | 0 | 1 | 0.3 | PHAU flattened |
| 071035 | 2 | 1 | 0 | 0 | 0 | 0.7 | PHAU down, SAEX o.k. |
| 071036 | 0 | 1 | 0 | 0 | 1 | 0.2 | B.R. at riverside edge |
| 071037 | 2 | 3 | 1 | 0 | 0 | 0.8 | roots exposed |
| 071038 | 2 | 1 | 0 | 0 | 0 | 0.4 | PHAU down, SAEX o.k. |
| 071040 | 0 | 1 | 0 | 0 | 1 | 0.1 | affected area only |
| 071042 | | | | | | | > 50 kcfs |
| 071043 | 1 | 1 | 1 | 0 | 1 | 0.1 | affected area only |
| 071044 | | | | | | | > 50 kcfs |
| 071048 | 1 | 1 | 0 | 0 | 0 | 0.1 | only riverside 3 m hit |
| 071049 | | | | | | | > 50 kcfs |

Polygon Damage Assessment
Site: 94 L

May 1997

| Polygon | Damage | Deposit | Scour | Algae | Debris | Depth | Notes: |
|---------|--------|---------|-------|-------|--------|-------|------------------------|
| 094002 | 3 | 2 | 1 | 0 | 0 | 1.8 | much scoured away |
| 094003 | 1 | 1 | 1 | 1 | 0 | 1.2 | |
| 094004 | 1 | 2 | 0 | 1 | 0 | 1.1 | deposit on talus side |
| 094005 | 1 | 2 | 0 | 0 | 0 | 1.5 | |
| 094006 | 2 | 2 | 0 | 0 | 1 | 0.7 | |
| 094010 | 0 | 1 | 0 | 0 | 0 | 0.9 | |
| 094011 | 2 | 1 | 1 | 1 | 0 | 0.5 | |
| 094012 | 0 | 1 | 0 | 0 | 1 | 0.1 | BR in plot |
| 094017 | 1 | 1 | 0 | 0 | 1 | 1.6 | |
| 094018 | | | | | | | > 50 kcfs |
| 094024 | 3 | 1 | 1 | 1 | 1 | 0.8 | heavy scour veg damage |
| 094025 | 2 | 1 | 1 | 1 | 0 | 0.7 | cobbles exposed |
| 094026 | 2 | 0 | 1 | 0 | 1 | 0.7 | bark damage |
| 094034 | 2 | 1 | 0 | 0 | 0 | 0.6 | |
| 094035 | 1 | 2 | 0 | 1 | 0 | 0.3 | |
| 094036 | | | | | | | > 50 kcfs |
| 094037 | 2 | 1 | 1 | 1 | 1 | 0.4 | |
| 094038 | | | | | | | > 50 kcfs |
| 094039 | | | | | | | > 50 kcfs |
| 094040 | | | | | | | > 50 kcfs |
| 094045 | 2 | 2 | 1 | 0 | 0 | 1.4 | river side scoured |
| 094050 | 2 | 1 | 0 | 0 | 0 | 0.6 | |
| 094051 | 1 | 2 | 0 | 0 | 1 | 0.6 | |
| 094053 | 1 | 1 | 0 | 1 | 0 | 0.4 | |

Polygon Damage Assessment
Site: 123 L

May 1997

| Polygon | Damage | Deposit | Scour | Algae | Debris | Depth | Notes: |
|---------|--------|---------|-------|-------|--------|-------|---------------------------|
| 123002 | 1 | 3 | 1 | 1 | 0 | 0.6 | |
| 123003 | 0 | 1 | 0 | 0 | 1 | 0.1 | Edge of flooding |
| 123004 | 1 | 3 | 0 | 1 | 1 | 0.1 | |
| 123009 | 1 | 2 | 0 | 1 | 1 | 0.5 | |
| 123012 | 0 | 1 | 0 | 0 | 0 | 0.4 | |
| 123014 | 1 | 1 | 1 | 1 | 1 | 0.9 | Driftwood present |
| 123017 | 1 | 1 | 1 | 1 | 1 | 1.3 | Driftwood present |
| 123019 | 1 | 3 | 0 | 1 | 0 | 0.9 | |
| 123026 | 1 | 1 | 0 | 1 | 1 | 0.5 | Lots of driftwood |
| 123027 | 2 | 2 | 1 | 1 | 1 | 0.6 | Lots of woody debris |
| 123033 | 1 | 3 | 1 | 0 | 0 | 1.1 | |
| 123034 | 3 | 1 | 1 | 0 | 1 | 0.7 | 2/3 of polygon eroded |
| 123035 | 1 | 3 | 0 | 0 | 0 | 0.2 | |
| 123036 | 0 | 1 | 0 | 0 | 1 | 0.4 | downstream edge = B.ring |
| 123039 | 2 | 2 | 1 | 1 | 1 | 0.9 | Scouring on river side |
| 123041 | 2 | 1 | 1 | 1 | 1 | 1.4 | |
| 123042 | 2 | 2 | 1 | 1 | 0 | 1.2 | |
| 123043 | 1 | 1 | 0 | 0 | 1 | 0.1 | Driftwood / B.ring |
| 123044 | 1 | 1 | 0 | 1 | 0 | 0.2 | |
| 123049 | 3 | 3 | 0 | 1 | 1 | 0.9 | |
| 123050 | 3 | 1 | 1 | 1 | 1 | 1.7 | heavy plant scour |
| 123051 | 2 | 2 | 1 | 1 | 1 | 0.7 | river side plants scoured |
| 123052 | 3 | 1 | 1 | 0 | 0 | 0.4 | SAEX/TARA hit hard |
| 123053 | 1 | 3 | 0 | 1 | 1 | 0.6 | |
| 123063 | 0 | 3 | 0 | 0 | 0 | 1.1 | |
| 123064 | 1 | 1 | 0 | 0 | 1 | 0.5 | |

Polygon Damage Assessment
Site: 194 L

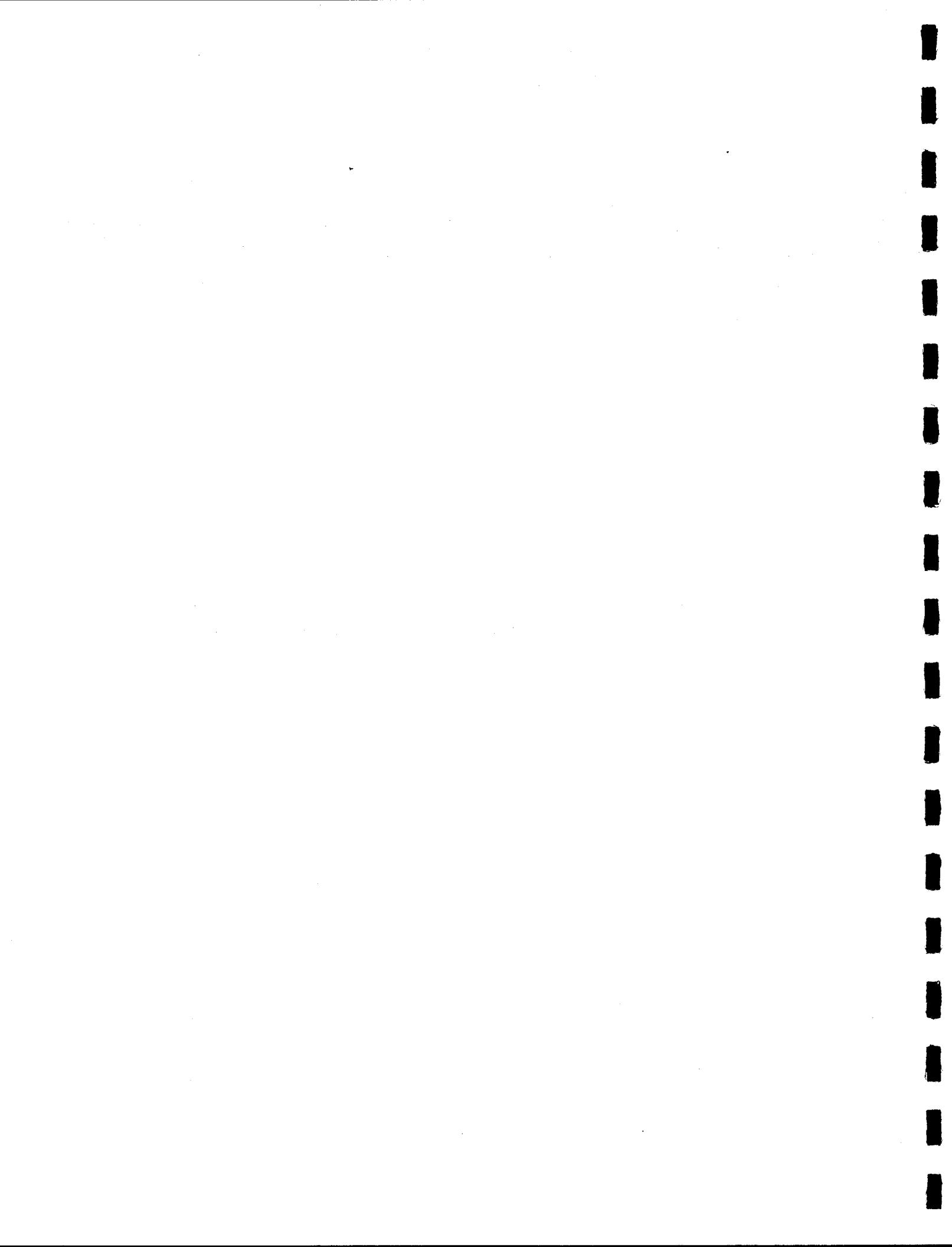
May 1997

| Polygon | Damage | Deposit | Scour | Algae | Debris | Depth | Notes |
|---------|--------|---------|-------|-------|--------|-------|----------------------------|
| 194003 | 2 | 3 | 0 | 0 | 1 | 1.9 | |
| 194004 | 2 | 1 | 0 | 1 | 0 | 1.8 | plants bent |
| 194005 | 0 | 2 | 0 | 0 | 1 | 0.4 | heavy woody debris |
| 194007 | 0 | 1 | 0 | 0 | 1 | 1.4 | wood |
| 194010 | 1 | 3 | 1 | 1 | 0 | 1.35 | cutbank formed |
| 194011 | 1 | 3 | 0 | 1 | 0 | 1 | |
| 194013 | 2 | 3 | 0 | 1 | 1 | 0.6 | heavy woody debris |
| 194014 | 1 | 2 | 0 | 1 | 0 | 0.9 | |
| 194015 | 2 | 3 | 0 | 1 | 1 | 1.5 | |
| 194016 | 1 | 1 | 0 | 1 | 1 | 2.2 | dead fish bloat / floating |
| 194018 | 1 | 3 | 0 | 1 | 0 | 0.06 | |
| 194019 | 1 | 3 | 0 | 1 | 0 | 0.35 | |
| 194020 | 1 | 2 | 0 | 1 | 0 | 0.15 | |
| 194021 | 1 | 3 | 0 | 1 | 1 | 0.4 | |
| 194022 | 1 | 3 | 0 | 1 | 1 | 0.85 | |
| 194023 | 0 | 3 | 0 | 1 | 0 | 0.95 | |
| 194024 | 1 | 2 | 0 | 1 | 0 | 1.6 | Toads!!! |
| 194025 | 0 | 1 | 0 | 0 | 1 | 0.7 | B.R. in polygon |
| 194028 | 0 | 1 | 0 | 0 | 1 | 0.9 | only hit area woody debris |
| 194029 | 0 | 1 | 0 | 0 | 0 | 0.1 | |
| 194030 | 0 | 1 | 0 | 0 | 1 | 0.2 | small debris |
| 194031 | 0 | 3 | 0 | 0 | 1 | 0.2 | |
| 194032 | 0 | 1 | 0 | 1 | 1 | 0.1 | duff moved into clumps |
| 194033 | 0 | 1 | 0 | 1 | 1 | 0.1 | duff moved into clumps |
| 194039 | 1 | 2 | 0 | 1 | 1 | 1.8 | cut bank |
| 194040 | 0 | 1 | 0 | 1 | 1 | 0.9 | |
| 194041 | 0 | 1 | 0 | 0 | 1 | 1.2 | woody debris in B.R. |
| 194042 | 0 | 1 | 0 | 0 | 1 | 0.2 | only hit area woody debris |
| 194043 | 0 | 0 | 0 | 1 | 1 | 0.3 | B.R. with woody debris |
| 194050 | 2 | 3 | 0 | 0 | 1 | 0.9 | affected area only |
| 194053 | 0 | 3 | 0 | 1 | 1 | 1.1 | large woody debris |
| 194060 | 1 | 3 | 0 | 0 | 0 | 1 | island is .3 m above flows |
| 194061 | 2 | 3 | 0 | 1 | 0 | 1.9 | |

Polygon Damage Assessment
Site: 209 L

May 1997

| Polygon | Damage | Deposit | Scour | Algae | Debris | Depth | Notes |
|---------|--------|---------|-------|-------|--------|-------|--------------------------|
| 209002 | 2 | 2 | 1 | 0 | 1 | 1.5 | heavy damage at boulders |
| 209003 | 2 | 1 | 1 | 1 | 0 | 0.9 | silty crust |
| 209004 | 1 | 1 | 1 | 1 | 1 | 0.3 | scouring at CYDA roots |
| 209005 | 1 | 2 | 0 | 1 | 1 | 0.2 | little effect |
| 209011 | 1 | 2 | 1 | 1 | 1 | 0.5 | scour flatten by rocks |
| 209012 | 0 | 2 | 0 | 1 | 0 | 0.3 | |
| 209013 | 1 | 2 | 0 | 1 | 0 | 0.1 | only affected area |
| 209021 | 0 | 3 | 0 | 1 | 0 | 0.9 | small vegetation buried |
| 209022 | 0 | 2 | 0 | 0 | 1 | 0.1 | |
| 209027 | 0 | 3 | 0 | 0 | 0 | 0.1 | 1.3 m sand on new beach |
| 209028 | 0 | 1 | 0 | 1 | 0 | 0.1 | |
| 209030 | 1 | 1 | 0 | 0 | 1 | 0.2 | |
| 209031 | 2 | 2 | 0 | 1 | 1 | 0.5 | EQHY flattened |
| 209034 | 0 | 2 | 0 | 1 | 1 | 0.5 | duff moved |
| 209035 | 1 | 2 | 0 | 0 | 0 | 0.5 | |
| 209038 | 0 | 2 | 0 | 0 | 0 | 0.6 | |
| 209046 | 1 | 2 | 0 | 1 | 0 | 0.5 | grasses buried |
| 209047 | 1 | 2 | 0 | 1 | 0 | 0.3 | grasses buried |
| 209054 | 1 | 2 | 0 | 1 | 1 | 1.5 | duff removed |
| 209055 | 1 | 3 | 0 | 1 | 0 | 0.6 | |
| 209056 | 0 | 2 | 0 | 1 | 0 | 0.2 | grasses buried |
| 209063 | 2 | 2 | 0 | 1 | 0 | 0.6 | EQHY flattenned |
| 209064 | 1 | 2 | 0 | 1 | 1 | 0.2 | duff buried / removed |
| 209065 | 0 | 1 | 0 | 1 | 1 | 0.4 | silty crust |
| 209066 | 1 | 2 | 0 | 1 | 1 | 0.6 | duff/algae/woody at edge |
| 209068 | 1 | 2 | 1 | 1 | 1 | 0.3 | |
| 209069 | 1 | 1 | 1 | 0 | 0 | 1.9 | mostly soured, new SCPU |
| 209071 | 1 | 3 | 0 | 0 | 0 | 0.7 | cut bank formed |



Appendix C

Data from Censuses of Vegetation Polygons Collected During the August / September 1996 Monitoring Trip

Data were collected in each of the nine monitoring sites between Lees Ferry and Diamond Creek on a field trip running from August 27 to September 10 1996. The comparable data for 1995 is contained in an appendix to an earlier report (Kearsley and Ayers 1996). The data columns are as follows:

POLYGON: A six-digit number of the form "MMMPPP" where "MMM" is a three-digit site identifier and "PPP" is a three-digit polygon identifier. For example, the polygon listed as 071016 contains data on polygon 16 from the sampling site at 71.4 L.

SPECIES: An acronym, as per Appendix A of this report, for the species whose percent foliar cover is being estimated for the polygon.

COVER: An estimate of the percent foliar cover of that species in that polygon. Numbers are means of 3 - 5 estimates made in each polygon.



Vegetation Polygon Data

1997 Sampling Trip

Site: 43 L

| Polygon | Species | Cover | | | | | | |
|---------|----------|--------|--------|----------|--------|--------|----------|--------|
| 043002 | AGROSTIS | 0.002 | 043007 | SAEX | 5.000 | 043011 | ECCR | 0.001 |
| 043002 | ARGL | 0.002 | 043007 | TARA | 0.001 | 043011 | ELEOCH | 0.667 |
| 043002 | ARLU | 0.002 | 043007 | TYDO | 0.001 | 043011 | EQAR | 0.367 |
| 043002 | ASSP | 0.204 | 043008 | ABUTIL | 0.005 | 043011 | GNCH | 0.037 |
| 043002 | BAEM | 1.000 | 043008 | ARGL | 0.010 | 043011 | JUTO | 0.033 |
| 043002 | BRLN | 0.002 | 043008 | BOBA | 1.000 | 043011 | MELIL | 0.003 |
| 043002 | BHWI | 0.002 | 043008 | BRLN | 3.500 | 043011 | PACA | 1.000 |
| 043002 | ELCA | 0.202 | 043008 | BROMUS | 0.010 | 043011 | PHAU | 24.333 |
| 043002 | EQAR | 2.000 | 043008 | DYPE | 0.005 | 043011 | PLLA | 0.003 |
| 043002 | JUBA | 0.002 | 043008 | GUTIERRZ | 0.500 | 043011 | SAEX | 0.370 |
| 043002 | JUTO | 0.001 | 043008 | STPA | 0.005 | 043011 | SCAC | 6.667 |
| 043002 | MEAR | 0.004 | 043008 | TARA | 0.001 | 043011 | SCPU | 0.001 |
| 043002 | MUAS | 5.000 | 043009 | AGROSTIS | 0.003 | 043011 | TARA | 1.033 |
| 043002 | PHAU | 0.001 | 043009 | AGROSTIS | 0.003 | 043011 | TYDO | 26.667 |
| 043002 | PLLA | 0.001 | 043009 | ARLU | 0.003 | 043011 | VERONICA | 0.037 |
| 043002 | PRGL | 0.002 | 043009 | BAEM | 1.670 | 043012 | ACGR | 0.001 |
| 043002 | SAEX | 41.000 | 043009 | CAAQ | 38.333 | 043012 | ARGL | 0.002 |
| 043002 | SPCR | 0.001 | 043009 | EQAR | 20.000 | 043012 | ASSP | 0.020 |
| 043002 | TARA | 34.000 | 043009 | EQFE | 2.000 | 043012 | BAEM | 9.400 |
| 043003 | ABUTIL | 0.002 | 043009 | GNCH | 0.003 | 043012 | BRLN | 0.001 |
| 043003 | ACGR | 0.004 | 043009 | JUAR | 3.333 | 043012 | BROMUS | 1.800 |
| 043003 | ALIN | 0.002 | 043009 | JUBA | 1.003 | 043012 | ENCELIA | 0.002 |
| 043003 | ARGL | 0.002 | 043009 | JUTO | 0.667 | 043012 | EQAR | 0.001 |
| 043003 | ASSP | 0.002 | 043009 | MUAS | 0.003 | 043012 | EQFE | 0.040 |
| 043003 | BAEM | 0.001 | 043009 | PHAU | 0.333 | 043012 | HEVI | 0.002 |
| 043003 | BOBA | 0.001 | 043009 | PLMA | 0.003 | 043012 | SACY | 0.422 |
| 043003 | BROMUS | 0.004 | 043009 | POMO | 0.003 | 043012 | SAEX | 32.000 |
| 043003 | DISP | 0.002 | 043009 | SAEX | 26.667 | 043012 | SPCR | 0.400 |
| 043003 | ENCELIA | 0.006 | 043009 | SONCHUS | 0.001 | 043012 | SPCR | 0.200 |
| 043003 | GUTIERRZ | 0.602 | 043009 | TARA | 1.673 | 043012 | TARA | 23.000 |
| 043003 | MAPI | 0.200 | 043009 | TYDO | 3.667 | 043012 | TESE | 22.200 |
| 043003 | SACY | 0.001 | 043010 | AGROSTIS | 0.001 | 043014 | AGROSTIS | 13.333 |
| 043003 | SAEX | 0.004 | 043010 | BAEM | 0.001 | 043014 | ARLU | 0.003 |
| 043003 | SAIB | 0.001 | 043010 | BOBA | 0.001 | 043014 | BAEM | 2.333 |
| 043003 | SPCR | 0.202 | 043010 | EQAR | 15.333 | 043014 | CECA | 0.001 |
| 043003 | SPCR | 0.004 | 043010 | GNCH | 0.003 | 043014 | ELCA | 0.033 |
| 043003 | SPFL | 0.002 | 043010 | JUAR | 5.000 | 043014 | EQAR | 0.001 |
| 043003 | STPA | 0.402 | 043010 | JUBA | 0.001 | 043014 | JUAR | 0.033 |
| 043003 | STPI | 0.002 | 043010 | MELIL | 0.003 | 043014 | JUBA | 0.667 |
| 043003 | TARA | 10.600 | 043010 | MUAS | 18.667 | 043014 | JUTO | 0.001 |
| 043003 | TESE | 19.200 | 043010 | PACA | 0.003 | 043014 | MUAS | 3.333 |
| 043007 | AGROSTIS | 5.000 | 043010 | PHAU | 71.667 | 043014 | PLMA | 0.001 |
| 043007 | AGROSTIS | 0.010 | 043010 | SAEX | 3.337 | 043014 | SAEX | 1.700 |
| 043007 | BAEM | 5.000 | 043010 | TARA | 8.337 | 043014 | TYDO | 0.001 |
| 043007 | EQAR | 5.000 | 043010 | TYDO | 0.001 | 043015 | BAEM | 3.333 |
| 043007 | JUAR | 1.000 | 043011 | AGROSTIS | 7.667 | 043015 | PRGL | 0.033 |
| 043007 | JUTO | 2.000 | 043011 | BAEM | 2.667 | 043015 | SAEX | 20.000 |
| 043007 | MUAS | 50.000 | 043011 | CAAQ | 7.333 | 043015 | TARA | 46.667 |

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|--------|----------|--------|--------|----------|--------|--------|----------|--------|
| 043016 | BRLN | 0.010 | 043022 | COCA | 0.001 | 043027 | TESE | 0.250 |
| 043016 | BROMUS | 0.005 | 043022 | GNCH | 0.033 | 043028 | ARFR | 0.005 |
| 043016 | EQAR | 0.050 | 043022 | JUAR | 0.033 | 043028 | BAEM | 0.005 |
| 043016 | EQFE | 1.050 | 043022 | JUBA | 3.333 | 043028 | BRLN | 0.005 |
| 043016 | JUAR | 0.005 | 043022 | MUAS | 1.667 | 043028 | COCA | 0.005 |
| 043016 | LEMO | 0.001 | 043022 | SAEX | 2.667 | 043028 | DAWR | 0.500 |
| 043016 | MELIL | 0.001 | 043022 | TYDO | 0.001 | 043028 | ENCELIA | 0.005 |
| 043016 | PACA | 0.005 | 043023 | AGROSTIS | 5.000 | 043028 | ENCELIA | 0.005 |
| 043016 | PLMA | 0.005 | 043023 | ARLU | 0.005 | 043028 | EQFE | 6.000 |
| 043016 | SAEX | 25.000 | 043023 | ASSP | 0.050 | 043028 | ERCU | 0.250 |
| 043016 | SPCR | 0.055 | 043023 | BOBA | 5.000 | 043028 | GNCH | 0.500 |
| 043016 | TARA | 2.500 | 043023 | BRLN | 1.500 | 043028 | GUTIERRZ | 0.005 |
| 043016 | TESE | 0.001 | 043023 | BROMUS | 0.010 | 043028 | MUAS | 0.005 |
| 043017 | DAWR | 0.001 | 043023 | BRWI | 0.100 | 043028 | SAEX | 92.500 |
| 043017 | SAEX | 2.667 | 043023 | DAWR | 0.005 | 043028 | SPHAER | 0.005 |
| 043017 | TARA | 0.001 | 043023 | ELCA | 0.005 | 043028 | SPHAER | 0.005 |
| 043019 | AGROSTIS | 1.367 | 043023 | EQFE | 0.100 | 043031 | AGROSTIS | 0.001 |
| 043019 | BAEM | 8.333 | 043023 | ERCU | 15.000 | 043031 | AGROSTIS | 0.340 |
| 043019 | BIFR | 0.003 | 043023 | GNCH | 0.005 | 043031 | AGSM | 0.001 |
| 043019 | BRLN | 0.037 | 043023 | GUTIERRZ | 0.050 | 043031 | AGSM | 0.003 |
| 043019 | CAAQ | 5.667 | 043023 | MELIL | 0.005 | 043031 | ASSU | 0.001 |
| 043019 | CYER | 0.003 | 043023 | MUAS | 3.000 | 043031 | BAEM | 0.001 |
| 043019 | ECCR | 0.003 | 043023 | SAEX | 2.000 | 043031 | BIFR | 0.001 |
| 043019 | ELCA | 0.003 | 043024 | BROMUS | 0.004 | 043031 | BOBA | 0.001 |
| 043019 | EQFE | 0.333 | 043024 | SAEX | 27.000 | 043031 | BRWI | 0.003 |
| 043019 | GNCH | 0.070 | 043025 | ABUTIL | 0.001 | 043031 | CECA | 0.001 |
| 043019 | JUAR | 1.000 | 043025 | ASSP | 1.000 | 043031 | COCA | 0.003 |
| 043019 | JUBA | 16.000 | 043025 | BROMUS | 13.000 | 043031 | EQAR | 0.001 |
| 043019 | JUTO | 2.000 | 043025 | SAEX | 8.200 | 043031 | EQFE | 0.001 |
| 043019 | LEMO | 0.003 | 043025 | SPCR | 0.100 | 043031 | ERCU | 0.007 |
| 043019 | MAPI | 0.001 | 043025 | STPI | 0.054 | 043031 | GNCH | 0.010 |
| 043019 | MELIL | 0.003 | 043025 | TARA | 82.000 | 043031 | HOJU | 0.003 |
| 043019 | MUAS | 26.667 | 043026 | ASSP | 1.000 | 043031 | JUAR | 3.333 |
| 043019 | PACA | 0.733 | 043026 | BAEM | 5.000 | 043031 | JUBA | 1.667 |
| 043019 | PHAU | 0.033 | 043026 | BASL | 7.500 | 043031 | JULO | 0.001 |
| 043019 | PLMA | 0.007 | 043026 | BRLN | 0.500 | 043031 | JUTO | 0.003 |
| 043019 | POMO | 0.007 | 043026 | BROMUS | 1.000 | 043031 | MELIL | 0.003 |
| 043019 | RUMEX | 0.003 | 043026 | BROMUS | 2.000 | 043031 | MUAS | 0.001 |
| 043019 | SAEX | 33.333 | 043026 | GUTIERRZ | 0.750 | 043031 | PACA | 0.001 |
| 043019 | SCPU | 0.067 | 043026 | ORHY | 0.001 | 043031 | PLMA | 0.001 |
| 043019 | SONCHUS | 0.007 | 043026 | SAEX | 15.000 | 043031 | PLMA | 0.001 |
| 043019 | SPCR | 0.067 | 043026 | SPCR | 9.000 | 043031 | POMO | 0.003 |
| 043019 | TARA | 2.670 | 043026 | SPHAER | 0.005 | 043031 | SCPU | 0.001 |
| 043019 | TESE | 2.667 | 043026 | TARA | 3.000 | 043031 | SONCHUS | 0.003 |
| 043019 | TYDO | 0.001 | 043026 | TESE | 8.500 | 043031 | TARA | 0.001 |
| 043019 | VERONICA | 0.003 | 043027 | ARGL | 0.001 | 043031 | TYDO | 0.001 |
| 043019 | VUOC | 0.003 | 043027 | BROMUS | 0.250 | 043031 | VERONICA | 1.667 |
| 043021 | BAEM | 0.333 | 043027 | GUTIERRZ | 0.001 | 043032 | ABUTIL | 0.007 |
| 043021 | SAEX | 20.000 | 043027 | ORHY | 0.001 | 043032 | ARFR | 0.007 |
| 043022 | AGROSTIS | 3.333 | 043027 | SAEX | 7.500 | 043032 | ARFR | 0.001 |
| 043022 | AGROSTIS | 0.667 | 043027 | SPCR | 0.001 | 043032 | ARFR | 0.003 |
| 043022 | BAEM | 1.667 | 043027 | SPHAER | 0.001 | 043032 | ARGL | 0.003 |

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|--------|----------|--------|--------|----------|--------|--------|----------|--------|
| 043032 | ARLU | 0.003 | 043038 | STPI | 0.003 | 043048 | TARA | 11.667 |
| 043032 | ASSP | 11.667 | 043038 | TARA | 12.500 | 043049 | AGROSTIS | 5.000 |
| 043032 | BASE | 0.001 | 043041 | AGROSTIS | 0.010 | 043049 | AGROSTIS | 3.333 |
| 043032 | BOBA | 0.003 | 043041 | AGROSTIS | 0.500 | 043049 | AMAC | 0.033 |
| 043032 | BRLN | 7.333 | 043041 | AGSM | 0.005 | 043049 | BAEM | 6.667 |
| 043032 | CERE | 0.001 | 043041 | ASSU | 0.005 | 043049 | BOBA | 1.667 |
| 043032 | DAMO | 0.001 | 043041 | BAEM | 0.500 | 043049 | BRLN | 0.007 |
| 043032 | DISP | 0.333 | 043041 | BOBA | 0.005 | 043049 | BRWI | 0.001 |
| 043032 | DYPE | 0.003 | 043041 | BRWI | 0.001 | 043049 | ELCA | 0.333 |
| 043032 | GUTIERRZ | 0.337 | 043041 | CERE | 0.001 | 043049 | GNCH | 0.033 |
| 043032 | NITR | 0.001 | 043041 | ELCA | 0.005 | 043049 | JUTO | 0.003 |
| 043032 | OEHO | 0.001 | 043041 | EQFE | 1.000 | 043049 | MUAS | 0.001 |
| 043032 | ORHY | 0.003 | 043041 | ERCU | 0.505 | 043049 | PACA | 0.001 |
| 043032 | PACA | 0.001 | 043041 | GNCH | 0.005 | 043049 | PLMA | 0.001 |
| 043032 | SAEX | 0.667 | 043041 | MUAS | 0.001 | 043049 | SAEX | 4.333 |
| 043032 | SPCR | 0.003 | 043041 | OEHO | 0.005 | 043049 | SCSC | 0.001 |
| 043032 | STPA | 0.670 | 043041 | POMO | 0.005 | 043049 | SIHY | 0.001 |
| 043032 | STPI | 0.001 | 043041 | TARA | 1.005 | 043049 | SOOC | 0.001 |
| 043032 | TARA | 3.500 | 043042 | AGROSTIS | 0.003 | 043049 | TARA | 0.003 |
| 043033 | ACGR | 0.001 | 043042 | BAEM | 0.003 | 043050 | ACGR | 0.001 |
| 043033 | ARFR | 0.001 | 043042 | EQFE | 0.333 | 043050 | ARGL | 0.025 |
| 043033 | ARGL | 0.003 | 043042 | JUAR | 0.001 | 043050 | ASTRAG | 0.275 |
| 043033 | ASSP | 0.003 | 043042 | PHAU | 3.333 | 043050 | BAEM | 0.250 |
| 043033 | ATCA | 0.001 | 043042 | SAEX | 0.001 | 043050 | BRLN | 0.001 |
| 043033 | BRLN | 1.667 | 043042 | SCPU | 0.003 | 043050 | BROMUS | 0.025 |
| 043033 | BROMUS | 0.340 | 043042 | TARA | 0.003 | 043050 | DAMO | 0.500 |
| 043033 | ENCELIA | 0.001 | 043043 | ASSP | 0.667 | 043050 | DIBR | 3.025 |
| 043033 | ENCELIA | 0.001 | 043043 | BAEM | 0.001 | 043050 | DISP | 0.528 |
| 043033 | ERIN | 0.003 | 043043 | BRLN | 0.003 | 043050 | ERCU | 0.001 |
| 043033 | GUTIERRZ | 3.667 | 043043 | DIBR | 1.670 | 043050 | GUTIERRZ | 0.250 |
| 043033 | MAPI | 0.001 | 043043 | EQFE | 0.001 | 043050 | OEPA | 0.005 |
| 043033 | ORHY | 0.173 | 043043 | GNCH | 0.003 | 043050 | SAEX | 11.250 |
| 043033 | SPFL | 1.670 | 043043 | JUBA | 0.001 | 043050 | SAIB | 0.001 |
| 043033 | SPHAER | 0.170 | 043043 | MUAS | 0.003 | 043050 | SCSC | 0.025 |
| 043033 | STPA | 0.170 | 043043 | PACA | 0.333 | 043050 | SPCO | 0.025 |
| 043033 | STPI | 0.003 | 043043 | PLLA | 0.001 | 043050 | SPFL | 0.001 |
| 043033 | TARA | 8.333 | 043043 | POMO | 0.001 | 043050 | SPGI | 0.750 |
| 043036 | SAEX | 0.010 | 043043 | SAEX | 12.000 | 043050 | STPA | 0.001 |
| 043037 | ASSP | 1.667 | 043043 | SPCR | 0.337 | 043050 | TARA | 0.750 |
| 043037 | SAEX | 8.667 | 043043 | SPGI | 0.001 | 043057 | AGROSTIS | 0.001 |
| 043037 | SPCR | 0.003 | 043043 | TARA | 0.337 | 043057 | ELCA | 0.001 |
| 043037 | TARA | 0.001 | 043048 | AGROSTIS | 0.001 | 043057 | GNCH | 0.001 |
| 043038 | BAEM | 3.750 | 043048 | AMAC | 0.003 | 043057 | MUAS | 0.005 |
| 043038 | BOBA | 0.001 | 043048 | ASSP | 0.001 | 043057 | PLLA | 0.001 |
| 043038 | BRLN | 0.001 | 043048 | BAEM | 0.001 | 043057 | SAEX | 2.500 |
| 043038 | EQFE | 0.001 | 043048 | CAAQ | 0.003 | 043057 | SCPU | 0.500 |
| 043038 | FAPA | 0.001 | 043048 | GNCH | 0.003 | 043057 | VERONICA | 0.001 |
| 043038 | GUTIERRZ | 0.001 | 043048 | GUTIERRZ | 0.003 | 043059 | BAEM | 0.167 |
| 043038 | ORHY | 0.001 | 043048 | SAEX | 13.667 | 043059 | DISP | 0.003 |
| 043038 | SAEX | 1.500 | 043048 | SAIB | 0.001 | 043059 | HOJU | 0.003 |
| 043038 | SPCR | 0.003 | 043048 | SCSC | 0.003 | 043059 | MUAS | 0.001 |
| 043038 | STPA | 0.001 | 043048 | SPCR | 0.001 | 043059 | SAEX | 31.667 |

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|--------|----------|--------|
| 043059 | STPA | 0.333 |
| 043060 | ASSP | 0.001 |
| 043060 | BAEM | 3.750 |
| 043060 | BROMUS | 5.525 |
| 043060 | LEMO | 0.001 |
| 043060 | SCSC | 0.001 |
| 043060 | STPI | 0.500 |
| 043060 | TARA | 77.500 |
| 043061 | AGROSTIS | 40.000 |
| 043061 | AGSM | 0.001 |
| 043061 | APGR | 0.001 |
| 043061 | ARLU | 0.001 |
| 043061 | ASSU | 0.055 |
| 043061 | BAEM | 5.500 |
| 043061 | BIFR | 0.005 |
| 043061 | BRLN | 0.010 |
| 043061 | BRWI | 3.500 |
| 043061 | CAAQ | 0.050 |
| 043061 | CECA | 0.005 |
| 043061 | ELCA | 0.001 |
| 043061 | GNCH | 0.500 |
| 043061 | JUAR | 0.500 |
| 043061 | JUBA | 0.001 |
| 043061 | JUTO | 0.550 |
| 043061 | MUAS | 5.500 |
| 043061 | PLMA | 0.001 |
| 043061 | SAEX | 0.050 |
| 043061 | SCSC | 0.001 |
| 043061 | TARA | 35.000 |
| 043063 | ASSP | 20.000 |
| 043063 | BAEM | 0.500 |
| 043063 | BRLN | 0.001 |
| 043063 | ELCA | 0.005 |
| 043063 | ENCELIA | 0.050 |
| 043063 | MUAS | 5.500 |
| 043063 | OEHO | 0.001 |
| 043063 | PACA | 0.001 |
| 043063 | SAEX | 2.500 |
| 043063 | SCSC | 0.500 |
| 043063 | SPCR | 1.500 |
| 043063 | STPA | 0.500 |
| 043063 | STPI | 0.001 |
| 043063 | TARA | 10.000 |

Vegetation Polygon Data
Site: 51 L

1997 Sampling Trip

| Polygon | Species | Cover | | | | | | |
|---------|----------|--------|--------|------|---------|--------|----------|--------|
| 051001 | AGSE | 0.005 | 051002 | PRGL | 0.170 | 051019 | ECCR | 0.006 |
| 051001 | APCA | 0.001 | 051002 | SACY | 0.167 | 051019 | ELCA | 0.001 |
| 051001 | APGR | 0.005 | 051002 | SAEX | 5.667 | 051019 | EQFE | 0.002 |
| 051001 | ASSU | 0.001 | 051002 | SCSC | 0.001 | 051019 | ERCU | 0.001 |
| 051001 | BAEM | 2.505 | 051002 | SOOC | 0.003 | 051019 | ERDI | 0.002 |
| 051001 | BASL | 0.001 | 051002 | SPCR | 0.003 | 051019 | ERIGERON | 0.001 |
| 051001 | BIFR | 0.001 | 051002 | TARA | 10.000 | 051019 | FEAR | 0.004 |
| 051001 | COCA | 3.000 | 051002 | TESE | 0.007 | 051019 | GNCH | 0.006 |
| 051001 | ELEOCH | 10.000 | 051002 | VETH | 0.003 | 051019 | LELA | 0.002 |
| 051001 | EQAR | 15.050 | 051002 | VUOC | 0.001 | 051019 | MELIL | 0.002 |
| 051001 | EQFE | 37.500 | 051009 | BRRU | 11.670 | 051019 | MUAS | 2.000 |
| 051001 | ERCU | 0.255 | 051009 | LEFR | 18.333 | 051019 | OEOH | 0.002 |
| 051001 | GNCH | 0.505 | 051009 | PRGL | 0.667 | 051019 | PACA | 22.002 |
| 051001 | HOJU | 0.001 | 051009 | SACY | 0.333 | 051019 | PLLA | 0.001 |
| 051001 | JUAR | 5.000 | 051009 | TARA | 66.667 | 051019 | PLMA | 0.001 |
| 051001 | JUTO | 0.500 | 051009 | TESE | 7.333 | 051019 | PLPA | 0.001 |
| 051001 | MELIL | 0.005 | 051012 | ELCA | 0.010 | 051019 | SAEX | 0.404 |
| 051001 | MUAS | 2.500 | 051012 | EQFE | 10.000 | 051019 | SAIB | 0.200 |
| 051001 | PLMA | 0.010 | 051012 | ERCU | 0.505 | 051019 | SOAS | 0.002 |
| 051001 | POMO | 0.010 | 051012 | JUTO | 0.005 | 051019 | SPCR | 0.402 |
| 051001 | PRGL | 0.005 | 051012 | MEAR | 0.505 | 051019 | SPFL | 0.200 |
| 051001 | SAEX | 5.500 | 051012 | MUAS | 0.005 | 051019 | TARA | 17.600 |
| 051001 | SCAC | 1.250 | 051012 | SAEX | 7.500 | 051019 | TESE | 0.002 |
| 051001 | SCPU | 0.005 | 051012 | SCAC | 100.000 | 051019 | VETH | 0.002 |
| 051001 | SCVA | 5.000 | 051012 | TESE | 0.500 | 051019 | XAST | 1.000 |
| 051001 | TAOF | 0.005 | 051012 | XAST | 0.001 | 051020 | AGSE | 0.750 |
| 051001 | TARA | 0.005 | 051013 | BAEM | 0.001 | 051020 | AGST | 0.003 |
| 051001 | TYDO | 0.001 | 051013 | BASA | 13.500 | 051020 | ASSU | 1.000 |
| 051001 | VERONICA | 0.010 | 051013 | EQFE | 1.005 | 051020 | BASL | 0.250 |
| 051002 | ABUTIL | 0.003 | 051013 | LELA | 5.000 | 051020 | EQFE | 3.753 |
| 051002 | ARLU | 0.003 | 051013 | PRGL | 10.000 | 051020 | FEAR | 0.001 |
| 051002 | ASSP | 7.000 | 051013 | SAEX | 32.500 | 051020 | GNCH | 0.003 |
| 051002 | ASSU | 0.333 | 051013 | TARA | 5.000 | 051020 | HOJU | 0.001 |
| 051002 | BAEM | 7.333 | 051013 | TESE | 1.000 | 051020 | JUAR | 9.250 |
| 051002 | BASL | 20.333 | 051018 | ASSU | 0.007 | 051020 | JUBA | 5.250 |
| 051002 | BOBA | 0.001 | 051018 | GNCH | 0.003 | 051020 | JUTO | 1.250 |
| 051002 | BRRI | 0.003 | 051018 | TARA | 0.010 | 051020 | LELA | 0.003 |
| 051002 | DYPE | 0.003 | 051018 | VEAN | 0.003 | 051020 | MUAS | 0.250 |
| 051002 | ELCA | 0.003 | 051019 | AGST | 0.001 | 051020 | PHAU | 0.250 |
| 051002 | EQFE | 1.333 | 051019 | AMAC | 0.001 | 051020 | PLLA | 0.250 |
| 051002 | ERCU | 0.167 | 051019 | BAEM | 0.002 | 051020 | POMO | 0.005 |
| 051002 | ERIGERON | 0.001 | 051019 | BASL | 0.004 | 051020 | SAEX | 0.255 |
| 051002 | GUTIERRZ | 0.003 | 051019 | BRLN | 0.002 | 051020 | SCPU | 2.250 |
| 051002 | LELA | 0.667 | 051019 | BRRU | 0.001 | 051020 | SPAM | 0.001 |
| 051002 | MAPI | 0.001 | 051019 | CAAQ | 0.001 | 051020 | TARA | 0.505 |
| 051002 | MELIL | 0.003 | 051019 | CHAL | 0.002 | 051020 | TYDO | 6.500 |
| 051002 | MUAS | 1.667 | 051019 | DIBR | 0.001 | 051020 | VEAN | 0.250 |

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|--------|----------|--------|--------|--------|--------|--------|--------|--------|
| 051021 | AGSE | 0.008 | 051022 | PRGL | 0.001 | 051025 | APGR | 0.003 |
| 051021 | AGST | 0.003 | 051022 | RUMEX | 0.001 | 051025 | ARLU | 0.001 |
| 051021 | ARLU | 0.001 | 051022 | SAEX | 1.000 | 051025 | BAEM | 0.167 |
| 051021 | ASSP | 0.005 | 051022 | SCAC | 4.000 | 051025 | CAAQ | 7.333 |
| 051021 | BAEM | 0.505 | 051022 | SCVA | 0.333 | 051025 | ELCA | 0.001 |
| 051021 | BASL | 10.000 | 051022 | SOAS | 0.001 | 051025 | ELEOCH | 0.333 |
| 051021 | CAAQ | 1.005 | 051022 | TARA | 0.001 | 051025 | EQAR | 0.003 |
| 051021 | CAAQ | 1.253 | 051022 | TARA | 0.001 | 051025 | EQFE | 0.333 |
| 051021 | CYER | 0.001 | 051022 | TYDO | 5.333 | 051025 | GNCH | 0.003 |
| 051021 | ELCA | 0.005 | 051022 | VEAM | 0.003 | 051025 | JUAR | 25.000 |
| 051021 | EQAR | 5.000 | 051022 | VEAN | 0.007 | 051025 | JUTO | 0.001 |
| 051021 | EQAR | 6.750 | 051023 | AGSE | 0.010 | 051025 | PLMA | 0.003 |
| 051021 | EQFE | 70.000 | 051023 | ASSU | 0.010 | 051025 | POMO | 0.001 |
| 051021 | EQFE | 0.003 | 051023 | CAAQ | 1.000 | 051025 | SAEX | 6.333 |
| 051021 | ERCU | 0.505 | 051023 | ECCR | 0.010 | 051025 | SCMI | 0.333 |
| 051021 | FEAR | 0.001 | 051023 | ELEOCH | 2.000 | 051025 | TARA | 6.667 |
| 051021 | GNCH | 0.005 | 051023 | GNCH | 0.010 | 051025 | TYDO | 1.337 |
| 051021 | JUAR | 5.753 | 051023 | JUAR | 2.000 | 051025 | VEAN | 0.003 |
| 051021 | JUBA | 0.253 | 051023 | JUTO | 0.010 | 051029 | AGSM | 0.002 |
| 051021 | JUTO | 2.878 | 051023 | MELIL | 0.010 | 051029 | CAAQ | 0.001 |
| 051021 | MUAS | 25.000 | 051023 | MUAS | 2.000 | 051029 | ECCR | 0.001 |
| 051021 | PACA | 0.001 | 051023 | PACA | 0.010 | 051029 | EQAR | 0.001 |
| 051021 | PLMA | 0.001 | 051023 | PHAU | 80.000 | 051029 | GNCH | 0.020 |
| 051021 | POMO | 0.005 | 051023 | PLLA | 0.010 | 051029 | JUAR | 2.000 |
| 051021 | PRGL | 1.000 | 051023 | POMO | 0.010 | 051029 | JUTO | 1.000 |
| 051021 | SAEX | 0.008 | 051023 | RUMEX | 0.010 | 051029 | PACA | 0.001 |
| 051021 | SAEX | 7.500 | 051023 | SAEX | 25.000 | 051029 | PLMA | 0.001 |
| 051021 | SCAC | 0.001 | 051023 | SCAC | 5.000 | 051029 | SAEX | 1.020 |
| 051021 | SCVA | 2.750 | 051023 | VEAM | 0.010 | 051029 | SCPU | 0.440 |
| 051021 | TAOF | 0.005 | 051024 | ARLU | 0.003 | 051029 | SOAS | 0.002 |
| 051021 | TARA | 0.003 | 051024 | BASL | 0.003 | 051029 | TARA | 0.200 |
| 051021 | TARA | 0.001 | 051024 | CAAQ | 51.667 | 051029 | TYDO | 8.000 |
| 051021 | TYDO | 9.250 | 051024 | CYER | 0.167 | 051030 | BASL | 1.250 |
| 051021 | TYDO | 0.001 | 051024 | ECCR | 0.001 | 051030 | SAEX | 21.250 |
| 051021 | VEAN | 0.003 | 051024 | ELEOCH | 0.667 | 051030 | TARA | 0.001 |
| 051021 | VERONICA | 0.001 | 051024 | EQFE | 0.667 | 051030 | TESE | 0.003 |
| 051022 | AGST | 1.667 | 051024 | GNCH | 0.003 | 051031 | ARLU | 0.001 |
| 051022 | ASSU | 0.001 | 051024 | JUAR | 2.337 | 051031 | BASL | 0.001 |
| 051022 | CECA | 0.001 | 051024 | JUTO | 5.670 | 051031 | EQFE | 0.001 |
| 051022 | ELEOCH | 0.170 | 051024 | MUAS | 10.000 | 051031 | EUPA | 0.001 |
| 051022 | EQFE | 3.667 | 051024 | PACA | 0.003 | 051031 | GNCH | 0.003 |
| 051022 | GNCH | 0.003 | 051024 | PHAU | 3.667 | 051031 | JUAR | 0.001 |
| 051022 | JUAR | 4.333 | 051024 | PLLA | 0.001 | 051031 | MUAS | 0.001 |
| 051022 | JUBA | 2.333 | 051024 | PLMA | 0.003 | 051031 | PACA | 0.033 |
| 051022 | JUTO | 8.333 | 051024 | POMO | 0.007 | 051031 | PLMA | 0.001 |
| 051022 | LELA | 0.001 | 051024 | SAEX | 30.000 | 051031 | SPCR | 0.001 |
| 051022 | MUAS | 10.000 | 051024 | SCPU | 0.001 | 051031 | TARA | 0.400 |
| 051022 | NAOF | 0.010 | 051024 | SCVA | 0.001 | 051032 | AMPO | 0.001 |
| 051022 | PACA | 0.001 | 051024 | SOAS | 1.837 | 051032 | ARLU | 0.001 |
| 051022 | PLLA | 0.003 | 051024 | TYDO | 1.167 | 051032 | ASSU | 0.001 |
| 051022 | PLMA | 0.007 | 051024 | VEAN | 0.007 | 051032 | BASL | 0.001 |
| 051022 | POMO | 0.003 | 051025 | AMAC | 0.001 | 051032 | BRRU | 0.001 |

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|--------|----------|--------|--------|-------|--------|--------|------|--------|
| 051032 | DICA | 0.001 | 051036 | DIBR | 0.001 | 051044 | BRRU | 1.200 |
| 051032 | EQFE | 0.001 | 051036 | MELIL | 0.001 | 051044 | DAWR | 0.001 |
| 051032 | ERCU | 0.001 | 051036 | SAEX | 0.503 | 051044 | EQFE | 0.042 |
| 051032 | ERIGERON | 0.001 | 051036 | SAIB | 0.001 | 051044 | LELA | 0.001 |
| 051032 | EUPA | 0.001 | 051036 | SPFL | 0.001 | 051044 | LEMO | 0.620 |
| 051032 | GNCH | 0.001 | 051036 | TARA | 27.500 | 051044 | PRGL | 0.400 |
| 051032 | GUSA | 0.001 | 051040 | BRRI | 0.001 | 051044 | SAEX | 6.400 |
| 051032 | LELA | 0.001 | 051040 | BRTE | 0.003 | 051044 | SPCR | 1.040 |
| 051032 | MELIL | 0.001 | 051040 | CHNI | 0.003 | 051044 | TARA | 34.000 |
| 051032 | PACA | 0.100 | 051040 | PRGL | 1.333 | 051044 | TESE | 5.200 |
| 051032 | PLPA | 0.001 | 051040 | SAEX | 9.333 | 051045 | AGST | 0.001 |
| 051032 | SAIB | 1.400 | 051040 | SAIB | 0.001 | 051045 | AMAC | 0.001 |
| 051032 | SOAS | 0.001 | 051040 | SPCR | 0.001 | 051045 | ARLU | 0.001 |
| 051032 | SPCO | 0.001 | 051040 | TARA | 3.333 | 051045 | BAEM | 0.333 |
| 051032 | TARA | 39.000 | 051040 | TESE | 20.000 | 051045 | BASL | 2.333 |
| 051033 | AGSE | 0.025 | 051041 | AMAC | 0.003 | 051045 | COCA | 0.007 |
| 051033 | AMAC | 0.001 | 051041 | BRTE | 0.003 | 051045 | DAWR | 0.001 |
| 051033 | AMAC | 0.001 | 051041 | DIBR | 0.003 | 051045 | ECCR | 0.001 |
| 051033 | ARLU | 0.003 | 051041 | EQFE | 0.001 | 051045 | ENFA | 0.003 |
| 051033 | ASTRAG | 0.003 | 051041 | ERCU | 0.001 | 051045 | EQAR | 8.500 |
| 051033 | BRLN | 0.025 | 051041 | SAEX | 23.333 | 051045 | EQFE | 0.001 |
| 051033 | CHAL | 0.003 | 051041 | SAIB | 2.670 | 051045 | EQFE | 0.001 |
| 051033 | DAWR | 0.001 | 051041 | SPCO | 0.700 | 051045 | ERDI | 0.003 |
| 051033 | DIBR | 0.001 | 051041 | TESE | 5.000 | 051045 | GNCH | 0.001 |
| 051033 | DISA | 0.001 | 051042 | ABEL | 0.001 | 051045 | LEFR | 0.007 |
| 051033 | ECCR | 0.500 | 051042 | AMAC | 0.002 | 051045 | MUAS | 35.000 |
| 051033 | EQFE | 0.001 | 051042 | AMAC | 0.002 | 051045 | OEHO | 0.001 |
| 051033 | ERCU | 0.001 | 051042 | ASSU | 0.002 | 051045 | PACA | 0.001 |
| 051033 | GNCH | 0.001 | 051042 | CHAL | 0.001 | 051045 | PHAU | 0.001 |
| 051033 | MELIL | 0.025 | 051042 | DAWR | 0.001 | 051045 | PRGL | 2.337 |
| 051033 | MUAS | 0.001 | 051042 | DIBR | 0.102 | 051045 | SAIB | 0.001 |
| 051033 | NITR | 0.003 | 051042 | EQFE | 0.001 | 051045 | SOAS | 0.001 |
| 051033 | PACA | 5.000 | 051042 | ERCU | 0.001 | 051045 | SPAM | 0.001 |
| 051033 | PLLA | 0.025 | 051042 | HEAN | 0.001 | 051045 | SPCR | 0.667 |
| 051033 | POMO | 0.003 | 051042 | MELIL | 0.004 | 051045 | SPFL | 0.003 |
| 051033 | SAEX | 1.250 | 051042 | OEHO | 0.001 | 051045 | STPI | 0.001 |
| 051033 | SAIB | 0.001 | 051042 | ORHY | 0.001 | 051045 | TARA | 0.500 |
| 051033 | SCPU | 0.001 | 051042 | PRGL | 0.001 | 051045 | TESE | 1.667 |
| 051033 | SPCR | 0.750 | 051042 | SAEX | 8.000 | 051046 | ARGL | 0.005 |
| 051033 | TARA | 12.750 | 051042 | SAIB | 0.802 | 051046 | BAEM | 15.000 |
| 051033 | TESE | 0.003 | 051042 | SOAS | 0.001 | 051046 | BASL | 5.000 |
| 051033 | VEBR | 0.001 | 051042 | SPCO | 0.001 | 051046 | BRRU | 0.010 |
| 051034 | EQFE | 1.667 | 051042 | TESE | 12.000 | 051046 | BRWI | 0.001 |
| 051034 | SAEX | 0.001 | 051043 | EQFE | 0.001 | 051046 | COCA | 0.005 |
| 051035 | AMAC | 0.003 | 051043 | SAEX | 3.000 | 051046 | DAWR | 5.500 |
| 051035 | CHNI | 0.003 | 051043 | SAIB | 0.001 | 051046 | ENFA | 0.250 |
| 051035 | MELIL | 0.003 | 051043 | TARA | 72.500 | 051046 | ENFR | 0.505 |
| 051035 | SAEX | 27.333 | 051044 | AMAC | 0.001 | 051046 | EQFE | 1.500 |
| 051035 | SAIB | 0.003 | 051044 | ARLU | 1.600 | 051046 | ERDI | 0.001 |
| 051035 | TARA | 0.001 | 051044 | ASSP | 0.001 | 051046 | LEFR | 3.000 |
| 051036 | AMAC | 0.003 | 051044 | BASL | 21.000 | 051046 | MAAN | 0.001 |
| 051036 | CHNI | 0.005 | 051044 | BRRI | 10.200 | 051046 | ORHY | 0.005 |

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|--------|------|--------|--------|--------|--------|--------|-------|--------|
| 051046 | PRGL | 1.000 | 051069 | COCA | 0.025 | 051092 | EPAD | 0.005 |
| 051046 | SOAS | 0.005 | 051069 | DAWR | 1.253 | 051092 | EQAR | 15.000 |
| 051046 | SOOC | 0.001 | 051069 | EQAR | 1.250 | 051092 | EQFE | 5.500 |
| 051046 | SPAM | 0.005 | 051069 | EQFE | 17.500 | 051092 | GNCH | 0.005 |
| 051046 | SPCR | 1.000 | 051069 | ERCU | 0.525 | 051092 | JUAR | 0.505 |
| 051046 | STPI | 0.005 | 051069 | ERDI | 0.253 | 051092 | JUEN | 0.005 |
| 051046 | TARA | 1.000 | 051069 | GNCH | 6.500 | 051092 | JUTO | 2.500 |
| 051050 | AGST | 0.025 | 051069 | GUMI | 0.025 | 051092 | MEAR | 0.500 |
| 051050 | APCA | 0.250 | 051069 | LELA | 2.550 | 051092 | MUAS | 10.000 |
| 051050 | BASL | 25.000 | 051069 | LEMO | 0.500 | 051092 | PHAU | 2.500 |
| 051050 | BRRU | 1.050 | 051069 | PACA | 0.001 | 051092 | PLLA | 0.001 |
| 051050 | BRWI | 2.500 | 051069 | POMO | 0.275 | 051092 | PLMA | 0.005 |
| 051050 | EQFE | 0.050 | 051069 | PRGL | 0.001 | 051092 | POMO | 0.005 |
| 051050 | LEMO | 0.028 | 051069 | SAEX | 35.000 | 051092 | RUMEX | 0.005 |
| 051050 | PRGL | 0.001 | 051069 | SOAS | 0.303 | 051092 | SAEX | 7.500 |
| 051050 | SAEX | 41.250 | 051069 | SOOC | 0.003 | 051092 | SCPU | 0.005 |
| 051050 | TARA | 10.000 | 051069 | TARA | 4.750 | 051092 | SOAS | 0.005 |
| 051055 | AGST | 0.670 | 051070 | AGST | 30.000 | 051092 | TARA | 7.500 |
| 051055 | ASSU | 0.007 | 051070 | ARLU | 0.033 | | | |
| 051055 | BAEM | 0.333 | 051070 | ASSU | 0.003 | | | |
| 051055 | BASL | 0.033 | 051070 | BAEM | 12.667 | | | |
| 051055 | BRLN | 0.003 | 051070 | BASL | 0.003 | | | |
| 051055 | BRWI | 0.003 | 051070 | BRLN | 0.003 | | | |
| 051055 | CAAQ | 10.003 | 051070 | CAAQ | 0.001 | | | |
| 051055 | CECA | 0.340 | 051070 | COCA | 0.003 | | | |
| 051055 | ELCA | 0.003 | 051070 | ECCR | 0.003 | | | |
| 051055 | EPAD | 0.003 | 051070 | ELCA | 0.001 | | | |
| 051055 | EQFE | 5.000 | 051070 | EQAR | 1.667 | | | |
| 051055 | FEAR | 0.333 | 051070 | EQFE | 3.333 | | | |
| 051055 | GNCH | 0.007 | 051070 | GNCH | 4.033 | | | |
| 051055 | HOJU | 0.003 | 051070 | JUAR | 0.001 | | | |
| 051055 | JUAR | 9.000 | 051070 | JUBA | 0.033 | | | |
| 051055 | JUBA | 3.337 | 051070 | LEMO | 0.070 | | | |
| 051055 | JUEN | 0.003 | 051070 | MELIL | 0.033 | | | |
| 051055 | JUTO | 0.337 | 051070 | NITR | 0.033 | | | |
| 051055 | MUAS | 18.333 | 051070 | OEOH | 0.003 | | | |
| 051055 | PLMA | 0.010 | 051070 | PACA | 0.067 | | | |
| 051055 | PRGL | 0.001 | 051070 | PLLA | 0.001 | | | |
| 051055 | SAEX | 4.333 | 051070 | PLMA | 1.000 | | | |
| 051055 | SOAS | 0.003 | 051070 | POMO | 0.003 | | | |
| 051055 | SOOC | 0.340 | 051070 | PRGL | 0.333 | | | |
| 051055 | TARA | 0.333 | 051070 | SAEX | 18.333 | | | |
| 051055 | VEAN | 0.003 | 051070 | SCPU | 0.001 | | | |
| 051069 | AGSM | 0.003 | 051070 | SOAS | 1.033 | | | |
| 051069 | AGST | 35.000 | 051070 | SPOROB | 0.003 | | | |
| 051069 | ARLU | 0.275 | 051070 | TARA | 20.000 | | | |
| 051069 | BAEM | 8.800 | 051070 | VEAM | 0.367 | | | |
| 051069 | BASL | 2.750 | 051092 | AGSE | 0.001 | | | |
| 051069 | BRLN | 0.025 | 051092 | AGST | 0.010 | | | |
| 051069 | BRRU | 0.250 | 051092 | BAEM | 2.500 | | | |
| 051069 | BRTE | 0.025 | 051092 | CAAQ | 37.500 | | | |
| 051069 | CAAQ | 0.025 | 051092 | COCA | 0.005 | | | |

Vegetation Polygon Data

Site: 55 R

1997 Sampling Trip

| Polygon | Species | Cover | | | | | | |
|---------|----------|--------|--------|----------|--------|--------|----------|--------|
| 055001 | APCA | 0.033 | 055010 | OEHO | 0.001 | 055012 | SCPU | 0.400 |
| 055001 | BAEM | 25.000 | 055010 | PACA | 13.333 | 055012 | SONCHUS | 0.001 |
| 055001 | CAAQ | 11.667 | 055010 | PLANTAG | 0.500 | 055012 | TYDO | 1.600 |
| 055001 | EQFE | 63.333 | 055010 | POMO | 0.001 | 055012 | VERONICA | 0.001 |
| 055001 | SAEX | 36.667 | 055010 | RACY | 0.003 | 055015 | AGST | 2.000 |
| 055001 | SCAC | 0.333 | 055010 | SAEX | 2.333 | 055015 | BAEM | 0.500 |
| 055001 | TARA | 3.333 | 055010 | SCPU | 0.003 | 055015 | CAAQ | 25.000 |
| 055008 | AGST | 0.100 | 055010 | SCVA | 0.001 | 055015 | CECA | 0.055 |
| 055008 | BAEM | 1.000 | 055010 | TARA | 0.337 | 055015 | ELCA | 0.050 |
| 055008 | CAAQ | 5.000 | 055010 | TYDO | 0.007 | 055015 | EQAR | 0.500 |
| 055008 | EQAR | 1.000 | 055010 | VERONICA | 0.010 | 055015 | EQFE | 2.500 |
| 055008 | EQFE | 5.000 | 055011 | AGST | 0.005 | 055015 | GNCH | 0.050 |
| 055008 | GNCH | 0.010 | 055011 | BAEM | 27.500 | 055015 | JUAR | 0.500 |
| 055008 | JUAR | 3.000 | 055011 | EQAR | 0.005 | 055015 | JUBA | 0.001 |
| 055008 | JUTO | 0.010 | 055011 | EQFE | 7.500 | 055015 | JUEN | 0.050 |
| 055008 | MELIL | 0.010 | 055011 | GNCH | 0.050 | 055015 | JUTO | 2.000 |
| 055008 | MUAS | 0.100 | 055011 | PACA | 2.000 | 055015 | MUAS | 0.050 |
| 055008 | PLANTAG | 0.010 | 055011 | PLANTAG | 0.001 | 055015 | PHAU | 2.500 |
| 055008 | SAEX | 0.100 | 055011 | PRGL | 0.050 | 055015 | PLANTAG | 2.500 |
| 055008 | TARA | 0.100 | 055011 | SAEX | 4.000 | 055015 | PLANTAG | 0.050 |
| 055009 | AGSE | 0.700 | 055011 | SONCHUS | 0.010 | 055015 | SAEX | 1.000 |
| 055009 | AGST | 0.033 | 055011 | SPCR | 0.010 | 055015 | SOOC | 0.050 |
| 055009 | ASSU | 0.003 | 055011 | TARA | 30.000 | 055015 | TARA | 2.500 |
| 055009 | BAEM | 8.000 | 055012 | AGSE | 0.024 | 055016 | AGSE | 1.000 |
| 055009 | EQFE | 11.667 | 055012 | AGST | 0.020 | 055016 | AGST | 1.667 |
| 055009 | GNCH | 0.040 | 055012 | APCA | 0.002 | 055016 | ASSU | 0.001 |
| 055009 | MELIL | 0.001 | 055012 | APGR | 0.020 | 055016 | BAEM | 4.333 |
| 055009 | PACA | 0.700 | 055012 | ASSP | 0.001 | 055016 | CECA | 0.003 |
| 055009 | PLANTAG | 0.001 | 055012 | ASSU | 0.002 | 055016 | EQFE | 0.667 |
| 055009 | PRGL | 1.000 | 055012 | CAAQ | 47.000 | 055016 | GNCH | 0.033 |
| 055009 | SAEX | 26.667 | 055012 | COCA | 0.001 | 055016 | JUBA | 1.667 |
| 055009 | SCPU | 0.033 | 055012 | CYER | 0.001 | 055016 | JUTO | 1.667 |
| 055009 | SONCHUS | 0.007 | 055012 | ELEOCH | 2.000 | 055016 | MELIL | 0.003 |
| 055009 | SPCR | 0.033 | 055012 | EQAR | 0.840 | 055016 | MUAS | 4.367 |
| 055009 | TARA | 5.000 | 055012 | EQFE | 0.001 | 055016 | PACA | 1.000 |
| 055010 | AGST | 0.670 | 055012 | GNCH | 0.001 | 055016 | PHAU | 1.000 |
| 055010 | APGR | 0.003 | 055012 | JUAR | 15.600 | 055016 | PLANTAG | 0.037 |
| 055010 | ASSU | 0.010 | 055012 | JUBA | 0.001 | 055016 | POMO | 0.033 |
| 055010 | BAEM | 0.337 | 055012 | JUTO | 0.640 | 055016 | PRGL | 0.700 |
| 055010 | CECA | 0.170 | 055012 | MEAR | 0.001 | 055016 | SAEX | 15.667 |
| 055010 | CECA | 0.003 | 055012 | MUAS | 0.001 | 055016 | SCPU | 0.033 |
| 055010 | ERIGERON | 0.010 | 055012 | NAOF | 0.020 | 055016 | SONCHUS | 0.001 |
| 055010 | GNCH | 0.010 | 055012 | PACA | 0.002 | 055016 | SOOC | 0.033 |
| 055010 | HOJU | 0.001 | 055012 | PLANTAG | 0.004 | 055016 | SPCR | 0.033 |
| 055010 | JUAR | 1.007 | 055012 | POMO | 0.022 | 055016 | TARA | 10.000 |
| 055010 | JUTO | 6.333 | 055012 | RACY | 0.001 | 055016 | TYDO | 0.033 |
| 055010 | LELA | 0.001 | 055012 | SAEX | 0.460 | 055017 | AGST | 0.667 |
| 055010 | MUAS | 1.670 | 055012 | SCAC | 1.820 | 055017 | ASSU | 0.003 |

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|--------|----------|--------|--------|----------|--------|--------|----------|--------|
| 055017 | BAEM | 3.337 | 055021 | JUBA | 17.500 | 055025 | POMO | 0.001 |
| 055017 | COCA | 0.033 | 055021 | JUTO | 1.250 | 055025 | PRGL | 0.001 |
| 055017 | DAWR | 0.001 | 055021 | MUAS | 0.050 | 055025 | SAEX | 40.000 |
| 055017 | DISA | 1.667 | 055021 | PHAU | 70.000 | 055025 | SCAC | 0.125 |
| 055017 | ECCR | 0.333 | 055021 | PLANTAG | 0.001 | 055025 | SCPUS | 2.125 |
| 055017 | EQFE | 15.000 | 055021 | PLANTAG | 0.025 | 055025 | SONCHUS | 0.003 |
| 055017 | GNCH | 2.367 | 055021 | SAEX | 7.500 | 055025 | SOOC | 0.250 |
| 055017 | JUTO | 0.001 | 055021 | SOOC | 0.775 | 055025 | SPCR | 0.001 |
| 055017 | MUAS | 2.033 | 055021 | TARA | 2.525 | 055025 | TARA | 3.950 |
| 055017 | OEHO | 0.001 | 055021 | TYDO | 0.250 | 055025 | VERONICA | 0.001 |
| 055017 | PACA | 12.000 | 055021 | VERONICA | 0.025 | 055026 | AGST | 0.010 |
| 055017 | PHAU | 1.667 | 055023 | AGST | 0.001 | 055026 | BAEM | 0.505 |
| 055017 | PRGL | 0.333 | 055023 | AMAC | 0.001 | 055026 | CAAQ | 1.000 |
| 055017 | SAEX | 16.667 | 055023 | BAEM | 8.000 | 055026 | ELEOCH | 15.000 |
| 055017 | SONCHUS | 0.003 | 055023 | BRLN | 0.001 | 055026 | EQAR | 0.505 |
| 055017 | SOOC | 0.033 | 055023 | COCA | 0.001 | 055026 | EQFE | 3.000 |
| 055017 | SPCR | 0.367 | 055023 | DICORIA | 0.003 | 055026 | GNCH | 0.010 |
| 055017 | TARA | 1.700 | 055023 | EQAR | 0.253 | 055026 | JUAR | 3.000 |
| 055017 | TRDU | 0.003 | 055023 | GNCH | 0.001 | 055026 | JUBA | 0.500 |
| 055017 | XAST | 0.333 | 055023 | MUAS | 0.001 | 055026 | JUTO | 0.255 |
| 055018 | BAEM | 2.000 | 055023 | OEHO | 0.003 | 055026 | MUAS | 3.000 |
| 055018 | BROMUS | 0.004 | 055023 | PHAU | 54.500 | 055026 | NITR | 0.001 |
| 055018 | BROMUS | 0.002 | 055023 | SAEX | 8.250 | 055026 | PACA | 0.005 |
| 055018 | COCA | 0.004 | 055023 | SAIB | 0.001 | 055026 | PHAU | 15.500 |
| 055018 | DAWR | 0.001 | 055023 | SCPUS | 0.755 | 055026 | PLANTAG | 0.010 |
| 055018 | DICORIA | 0.002 | 055023 | TARA | 3.500 | 055026 | POMO | 0.010 |
| 055018 | EQFE | 0.802 | 055024 | APGR | 0.001 | 055026 | RACY | 0.005 |
| 055018 | ERIGERON | 0.001 | 055024 | BAEM | 1.667 | 055026 | SAEX | 3.500 |
| 055018 | GNCH | 0.001 | 055024 | BROMUS | 0.003 | 055026 | SCMA | 0.001 |
| 055018 | MUAS | 0.001 | 055024 | EQFE | 3.337 | 055026 | SCPUS | 1.000 |
| 055018 | PACA | 0.001 | 055024 | GNCH | 0.170 | 055026 | SCVA | 0.005 |
| 055018 | PRGL | 0.001 | 055024 | MUAS | 0.667 | 055026 | TARA | 0.500 |
| 055018 | SAEX | 16.000 | 055024 | PACA | 0.001 | 055026 | TYDO | 0.505 |
| 055018 | SONCHUS | 0.001 | 055024 | PHAU | 0.337 | 055026 | VERONICA | 1.005 |
| 055018 | SPCR | 0.206 | 055024 | PLANTAG | 0.003 | 055027 | AGST | 0.005 |
| 055018 | TARA | 19.000 | 055024 | SAEX | 83.333 | 055027 | ASSP | 0.500 |
| 055020 | AGST | 2.500 | 055024 | SCPUS | 0.167 | 055027 | BAEM | 1.505 |
| 055020 | BAEM | 2.500 | 055024 | SOOC | 0.003 | 055027 | CAAQ | 0.500 |
| 055020 | EQFE | 0.001 | 055024 | TARA | 14.333 | 055027 | COCA | 0.010 |
| 055020 | PHAU | 0.500 | 055025 | AGST | 0.003 | 055027 | EQAR | 2.505 |
| 055020 | SAEX | 15.750 | 055025 | APGR | 0.003 | 055027 | EQFE | 35.000 |
| 055020 | SCPUS | 2.500 | 055025 | ARLU | 0.005 | 055027 | ERIGERON | 0.005 |
| 055020 | SONCHUS | 0.003 | 055025 | ASSP | 0.001 | 055027 | GNCH | 0.010 |
| 055020 | SPGI | 0.001 | 055025 | BAEM | 3.000 | 055027 | JUAR | 0.500 |
| 055020 | TARA | 3.000 | 055025 | BRLN | 0.008 | 055027 | JUTO | 0.005 |
| 055021 | AGST | 3.525 | 055025 | EQFE | 17.500 | 055027 | MUAS | 30.000 |
| 055021 | ASSP | 0.250 | 055025 | GNCH | 0.628 | 055027 | OEHO | 0.005 |
| 055021 | BAEM | 0.500 | 055025 | MUAS | 9.000 | 055027 | PLANTAG | 0.010 |
| 055021 | CAAQ | 0.001 | 055025 | OEHO | 0.003 | 055027 | SAEX | 14.000 |
| 055021 | EPAD | 0.003 | 055025 | PACA | 0.500 | 055027 | SCPUS | 0.005 |
| 055021 | EQAR | 0.250 | 055025 | PHAU | 5.250 | 055027 | SONCHUS | 0.005 |
| 055021 | GNCH | 0.028 | 055025 | PLANTAG | 0.005 | 055027 | SOOC | 0.005 |

| | | | | | | | | |
|--------|----------|--------|--------|---------|--------|--------|----------|---------|
| 055027 | TARA | 0.010 | 055037 | SPCR | 0.505 | 055044 | SAEX | 22.200 |
| 055027 | TYDO | 0.001 | 055037 | TARA | 0.550 | 055044 | SCAC | 0.200 |
| 055027 | VERONICA | 0.001 | 055037 | XAST | 0.001 | 055044 | SCVA | 0.001 |
| 055028 | ARDR | 0.003 | 055038 | BAEM | 7.800 | 055044 | SONCHUS | 0.204 |
| 055028 | BAEM | 22.500 | 055038 | EQFE | 2.502 | 055044 | SONCHUS | 0.002 |
| 055028 | BROMUS | 0.250 | 055038 | GNCH | 0.001 | 055044 | TYDO | 0.002 |
| 055028 | EQFE | 41.250 | 055038 | HOJU | 0.001 | 055045 | AGST | 0.003 |
| 055028 | GNCH | 0.001 | 055038 | LELA | 0.001 | 055045 | ASSU | 0.667 |
| 055028 | MUAS | 0.001 | 055038 | MUAS | 0.602 | 055045 | BAEM | 2.000 |
| 055028 | PHAU | 6.250 | 055038 | PACA | 0.002 | 055045 | CAAQ | 10.333 |
| 055028 | SAEX | 11.750 | 055038 | PLANTAG | 0.001 | 055045 | EQAR | 7.337 |
| 055028 | SOOC | 0.003 | 055038 | PRGL | 0.402 | 055045 | EQFE | 51.667 |
| 055028 | SPCR | 0.001 | 055038 | SAEX | 1.000 | 055045 | GNCH | 0.003 |
| 055028 | TARA | 1.255 | 055038 | SAIB | 0.200 | 055045 | MUAS | 23.667 |
| 055028 | TESE | 0.001 | 055038 | SCPU | 0.300 | 055045 | SAEX | 36.667 |
| 055029 | BAEM | 24.250 | 055038 | SPCR | 0.002 | 055045 | SCAC | 5.000 |
| 055029 | CAAQ | 1.250 | 055038 | TARA | 1.600 | 055045 | TARA | 3.333 |
| 055029 | EQAR | 0.001 | 055038 | VEBR | 0.001 | 055047 | CAAQ | 1.000 |
| 055029 | EQFE | 12.250 | 055039 | BAEM | 0.700 | 055047 | EQAR | 0.010 |
| 055029 | PHAU | 0.503 | 055039 | DICORIA | 0.001 | 055047 | JUTO | 1.000 |
| 055029 | SACY | 0.003 | 055039 | EQFE | 0.604 | 055047 | PHAU | 80.000 |
| 055029 | SAEX | 23.250 | 055039 | PHAU | 0.001 | 055047 | POMO | 0.010 |
| 055029 | TARA | 7.508 | 055039 | SAEX | 1.400 | 055047 | SAEX | 0.010 |
| 055034 | BAEM | 1.250 | 055039 | TARA | 8.600 | 055047 | SCPU | 1.000 |
| 055034 | CAAQ | 0.001 | 055040 | AGST | 0.001 | 055047 | SCVA | 1.000 |
| 055034 | COCA | 0.001 | 055040 | BAEM | 1.200 | 055047 | TYDO | 10.000 |
| 055034 | ECCR | 0.001 | 055040 | BOBA | 0.001 | 055048 | AGSM | 0.001 |
| 055034 | EQFE | 0.003 | 055040 | CHVI | 0.004 | 055048 | ARDR | 1.000 |
| 055034 | JUBA | 0.500 | 055040 | EQFE | 0.604 | 055048 | ARLU | 0.505 |
| 055034 | LELA | 0.005 | 055040 | MUAS | 0.001 | 055048 | ASSP | 0.500 |
| 055034 | MUAS | 0.758 | 055040 | PACA | 0.001 | 055048 | BROMUS | 1.500 |
| 055034 | PHAU | 0.003 | 055040 | PHAU | 0.001 | 055048 | BRWI | 0.050 |
| 055034 | SAEX | 3.253 | 055040 | PLANTAG | 0.001 | 055048 | CAAQ | 0.005 |
| 055034 | SCPU | 22.500 | 055040 | SAEX | 42.000 | 055048 | DAWR | 0.500 |
| 055034 | SOOC | 0.003 | 055040 | SAIB | 0.100 | 055048 | EQAR | 0.500 |
| 055034 | TARA | 0.750 | 055040 | SCPU | 0.002 | 055048 | EQFE | 17.500 |
| 055037 | AGST | 0.010 | 055040 | SPCR | 0.001 | 055048 | GUTIERRZ | 0.505 |
| 055037 | AMFI | 0.005 | 055040 | TARA | 0.800 | 055048 | MUAS | 0.005 |
| 055037 | BAEM | 0.001 | 055040 | VEBR | 0.001 | 055048 | MUAS | 2.500 |
| 055037 | DAWR | 0.001 | 055044 | AGSE | 0.006 | 055048 | SAEX | 25.000 |
| 055037 | DICORIA | 0.005 | 055044 | BAEM | 0.106 | 055048 | TARA | 2.500 |
| 055037 | DISA | 0.005 | 055044 | CAAQ | 22.600 | 055048 | TESE | 32.500 |
| 055037 | ECCR | 0.005 | 055044 | EQAR | 10.000 | 055049 | ARLU | 0.001 |
| 055037 | GNCH | 0.001 | 055044 | EQFE | 37.000 | 055049 | GNCH | 0.001 |
| 055037 | MELIL | 0.005 | 055044 | GNCH | 0.002 | 055049 | PHAU | 100.000 |
| 055037 | MUAS | 0.010 | 055044 | JUAR | 0.004 | 055049 | PLANTAG | 0.001 |
| 055037 | PACA | 2.000 | 055044 | JUBA | 0.400 | 055049 | PLANTAG | 0.001 |
| 055037 | PLANTAG | 0.005 | 055044 | JUTO | 0.001 | 055049 | TYDO | 0.500 |
| 055037 | PLANTAG | 0.001 | 055044 | LELA | 0.100 | 055049 | VERONICA | 0.001 |
| 055037 | POMO | 0.005 | 055044 | MUAS | 0.002 | 055054 | CAAQ | 90.000 |
| 055037 | SAEX | 0.010 | 055044 | PLANTAG | 0.002 | 055054 | EQAR | 20.000 |
| 055037 | SAIB | 0.255 | 055044 | PLANTAG | 0.001 | 055054 | EQFE | 10.000 |

| | | |
|--------|----------|--------|
| 055054 | PHAU | 15.000 |
| 055054 | SAEX | 5.000 |
| 055055 | BAEM | 17.500 |
| 055055 | EQFE | 6.500 |
| 055055 | SAEX | 67.500 |
| 055055 | TESE | 1.000 |
| 055056 | ASSP | 1.500 |
| 055056 | BAEM | 10.000 |
| 055056 | BROMUS | 5.000 |
| 055056 | CAAQ | 0.001 |
| 055056 | EQFE | 1.000 |
| 055056 | PHAU | 0.250 |
| 055056 | PRGL | 1.000 |
| 055056 | SACY | 0.250 |
| 055056 | SAEX | 5.000 |
| 055056 | TARA | 45.000 |
| 055056 | TESE | 0.005 |
| 055058 | BAEM | 0.001 |
| 055058 | BROMUS | 0.003 |
| 055058 | BROMUS | 1.007 |
| 055058 | COCA | 0.003 |
| 055058 | EQFE | 0.670 |
| 055058 | ERIGERON | 0.003 |
| 055058 | GNCH | 0.003 |
| 055058 | GUTIERRZ | 0.003 |
| 055058 | ORHY | 1.670 |
| 055058 | PRGL | 14.003 |
| 055058 | SAEX | 1.003 |
| 055058 | SPCR | 1.333 |
| 055058 | SPFL | 0.670 |
| 055058 | TARA | 1.667 |
| 055058 | TESE | 7.003 |
| 055070 | BAEM | 50.000 |
| 055070 | CAAQ | 5.000 |
| 055070 | EQFE | 5.000 |
| 055070 | MUAS | 5.000 |
| 055070 | PHAU | 10.000 |
| 055070 | SAEX | 2.000 |
| 055070 | TARA | 5.000 |
| 055070 | TESE | 0.010 |

Vegetation Polygon Data
Site: 68 R

1997 Sampling Trip

| Polygon | Species | Cover | | | | | | |
|---------|---------|--------|--------|---------|--------|--------|---------|--------|
| 068001 | AMAC | 0.003 | 068004 | TESE | 1.100 | 068031 | JUAR | 0.003 |
| 068001 | ARGL | 0.003 | 068019 | AGSE | 0.533 | 068031 | JUTO | 0.500 |
| 068001 | ASSU | 0.003 | 068019 | ALCA | 0.003 | 068031 | MELIL | 0.003 |
| 068001 | ASTRAG | 0.003 | 068019 | COCA | 0.003 | 068031 | SAEX | 47.500 |
| 068001 | BAEM | 14.333 | 068019 | EQFE | 68.333 | 068031 | SCVA | 2.500 |
| 068001 | BASL | 4.000 | 068019 | GNCH | 0.003 | 068031 | TESE | 5.503 |
| 068001 | BOBA | 0.007 | 068019 | JUAR | 0.067 | 068031 | TYDO | 0.500 |
| 068001 | COCA | 0.003 | 068019 | JUTO | 0.333 | 068032 | EQFE | 0.003 |
| 068001 | DICORIA | 0.001 | 068019 | MELIL | 0.337 | 068032 | SAEX | 1.000 |
| 068001 | ECCR | 0.003 | 068019 | PHAU | 0.001 | 068032 | TESE | 17.667 |
| 068001 | EQFE | 16.000 | 068019 | PLMA | 0.001 | 068033 | BAEM | 0.005 |
| 068001 | GNCH | 0.003 | 068019 | POMO | 0.033 | 068033 | COCA | 0.001 |
| 068001 | MELIL | 0.170 | 068019 | RACY | 0.001 | 068033 | DICORIA | 0.001 |
| 068001 | MUAS | 0.003 | 068019 | SAEX | 3.667 | 068033 | EQFE | 0.001 |
| 068001 | PACA | 0.003 | 068019 | TARA | 2.000 | 068033 | EUPHORB | 0.001 |
| 068001 | PLMA | 0.003 | 068019 | TESE | 0.300 | 068033 | MELIL | 2.500 |
| 068001 | POFE | 0.003 | 068020 | EQFE | 1.253 | 068033 | MUAS | 0.001 |
| 068001 | POMO | 0.007 | 068020 | PHAU | 0.001 | 068033 | OEHO | 0.001 |
| 068001 | PRGL | 1.667 | 068020 | SAEX | 1.628 | 068033 | ORHY | 0.001 |
| 068001 | SAEX | 11.000 | 068020 | SPAM | 0.001 | 068033 | PACA | 0.001 |
| 068001 | SAIB | 0.001 | 068020 | STSP | 0.250 | 068033 | SAEX | 24.000 |
| 068001 | SPCR | 0.003 | 068020 | TARA | 0.003 | 068033 | SPCO | 1.000 |
| 068001 | TARA | 1.000 | 068020 | TESE | 3.253 | 068033 | SPCR | 0.255 |
| 068001 | TESE | 1.337 | 068021 | PHAU | 10.000 | 068033 | TARA | 0.005 |
| 068002 | BASL | 5.750 | 068021 | SAEX | 4.000 | 068033 | TESE | 10.000 |
| 068002 | BOBA | 0.001 | 068021 | TARA | 2.000 | 068034 | ALCA | 3.333 |
| 068002 | BRLN | 0.001 | 068021 | TESE | 11.667 | 068034 | BROMUS | 0.003 |
| 068002 | DICORIA | 0.005 | 068022 | ALCA | 4.003 | 068034 | BROMUS | 0.003 |
| 068002 | ENFA | 0.001 | 068022 | SAEX | 0.333 | 068034 | SAEX | 0.333 |
| 068002 | OEPA | 0.001 | 068022 | SPCO | 0.001 | 068034 | SPCR | 0.033 |
| 068002 | SPCO | 0.005 | 068022 | TARA | 0.001 | 068034 | SPGI | 0.333 |
| 068002 | SPCR | 0.505 | 068022 | TESE | 38.333 | 068034 | TARA | 6.667 |
| 068002 | TARA | 3.000 | 068023 | SAEX | 0.667 | 068034 | TESE | 58.333 |
| 068002 | TESE | 51.250 | 068023 | SPCR | 0.007 | 068035 | ABEL | 0.003 |
| 068003 | BAEM | 2.400 | 068023 | TARA | 5.000 | 068035 | ABUTIL | 0.003 |
| 068003 | COCA | 0.002 | 068023 | TESE | 51.667 | 068035 | ORHY | 0.003 |
| 068003 | EQFE | 39.000 | 068024 | ALCA | 0.001 | 068035 | PRGL | 0.001 |
| 068003 | MELIL | 0.001 | 068024 | ASTRAG | 0.002 | 068035 | SPCR | 0.033 |
| 068003 | PHAU | 4.000 | 068024 | DICORIA | 0.001 | 068035 | TARA | 31.667 |
| 068003 | PRGL | 0.002 | 068024 | OEPA | 0.022 | 068035 | TESE | 2.667 |
| 068003 | SAEX | 57.000 | 068024 | ORHY | 0.022 | 068036 | ALCA | 0.167 |
| 068003 | SARA | 0.001 | 068024 | SPCO | 0.100 | 068036 | CHNI | 0.003 |
| 068003 | SOOC | 0.200 | 068024 | SPCR | 0.800 | 068036 | DICORIA | 0.333 |
| 068003 | TARA | 6.000 | 068024 | SPGI | 0.800 | 068036 | ORHY | 0.001 |
| 068003 | TESE | 6.200 | 068024 | TARA | 0.200 | 068036 | SAIB | 0.003 |
| 068004 | ALCA | 0.002 | 068024 | TESE | 5.200 | 068036 | TARA | 0.001 |
| 068004 | BROMUS | 0.022 | 068031 | AGSE | 0.001 | 068036 | TESE | 3.333 |
| 068004 | TARA | 77.000 | 068031 | EQFE | 1.003 | 068041 | ALCA | 1.750 |

| | | | | | |
|--------|---------|--------|--------|------|-------|
| 068041 | DICORIA | 0.001 | 068048 | SAIB | 0.001 |
| 068041 | EQFE | 0.125 | 068048 | SPCO | 0.337 |
| 068041 | ORHY | 0.003 | 068048 | TARA | 5.000 |
| 068041 | SAEX | 3.500 | 068048 | TESE | 1.000 |
| 068041 | SAIB | 0.001 | | | |
| 068041 | SPGI | 0.003 | | | |
| 068041 | TARA | 2.750 | | | |
| 068041 | TESE | 61.250 | | | |
| 068042 | ALCA | 6.500 | | | |
| 068042 | DISP | 0.001 | | | |
| 068042 | EQFE | 0.337 | | | |
| 068042 | SAEX | 5.000 | | | |
| 068042 | SPCO | 0.003 | | | |
| 068042 | SPCR | 0.003 | | | |
| 068042 | TARA | 0.667 | | | |
| 068042 | TESE | 11.667 | | | |
| 068042 | XAST | 0.001 | | | |
| 068043 | ABEL | 0.005 | | | |
| 068043 | ALCA | 0.001 | | | |
| 068043 | ARGL | 0.003 | | | |
| 068043 | ASTRAG | 0.001 | | | |
| 068043 | BEJU | 0.003 | | | |
| 068043 | BRLN | 0.001 | | | |
| 068043 | DYPE | 0.003 | | | |
| 068043 | ERDE | 0.003 | | | |
| 068043 | ERPU | 0.001 | | | |
| 068043 | ORHY | 0.003 | | | |
| 068043 | PAFI | 0.250 | | | |
| 068043 | POGR | 0.001 | | | |
| 068043 | SAEX | 0.001 | | | |
| 068043 | SCSC | 0.003 | | | |
| 068043 | SPAM | 0.001 | | | |
| 068043 | STPA | 0.350 | | | |
| 068043 | TARA | 0.001 | | | |
| 068043 | TESE | 1.250 | | | |
| 068043 | TILA | 0.003 | | | |
| 068048 | AGSE | 0.040 | | | |
| 068048 | ALCA | 0.667 | | | |
| 068048 | ARLU | 0.003 | | | |
| 068048 | ASSP | 0.003 | | | |
| 068048 | COCA | 0.003 | | | |
| 068048 | DAWR | 0.001 | | | |
| 068048 | EQFE | 2.003 | | | |
| 068048 | GNCH | 0.037 | | | |
| 068048 | HEAN | 0.007 | | | |
| 068048 | JUBA | 0.003 | | | |
| 068048 | MELIL | 0.333 | | | |
| 068048 | MUAS | 0.037 | | | |
| 068048 | PHAU | 40.000 | | | |
| 068048 | POMO | 0.007 | | | |
| 068048 | PRGL | 0.001 | | | |
| 068048 | SAEX | 17.333 | | | |

Vegetation Polygon Data
Site: 71 L

1997 Sampling Trip

| Polygon | Species | Cover | 072007 | GNCH | 0.001 | 072014 | TESE | 18.337 |
|---------|---------|--------|--------|-------|--------|--------|---------|--------|
| 072002 | ACGR | 0.025 | 072007 | MELIL | 0.005 | 072015 | ASSP | 0.001 |
| 072002 | AGSE | 0.001 | 072007 | PHAU | 0.001 | 072015 | ATCA | 0.001 |
| 072002 | AGST | 0.003 | 072007 | SAEX | 0.005 | 072015 | BRRU | 0.001 |
| 072002 | ALCA | 1.250 | 072007 | SCAC | 1.000 | 072015 | DISP | 0.001 |
| 072002 | ARLU | 0.001 | 072007 | SOOC | 0.001 | 072015 | PRGL | 0.001 |
| 072002 | BAEM | 2.000 | 072008 | ALCA | 0.170 | 072015 | SPCR | 0.001 |
| 072002 | BASE | 0.001 | 072008 | BAEM | 0.001 | 072015 | SUTO | 0.001 |
| 072002 | BASL | 4.250 | 072008 | CAAQ | 0.001 | 072015 | TARA | 0.001 |
| 072002 | BRLN | 0.128 | 072008 | ELCA | 0.001 | 072015 | TESE | 0.001 |
| 072002 | ENCELIA | 0.001 | 072008 | EQFE | 0.333 | 072019 | SAEX | 0.001 |
| 072002 | GNCH | 0.040 | 072008 | PHAU | 0.333 | 072019 | TARA | 0.001 |
| 072002 | JUAR | 0.001 | 072008 | SAEX | 10.333 | 072020 | ALCA | 5.000 |
| 072002 | JUTO | 0.001 | 072008 | TARA | 13.333 | 072020 | ASSP | 0.500 |
| 072002 | MELIL | 0.650 | 072008 | TESE | 13.333 | 072020 | SAEX | 2.000 |
| 072002 | MUAS | 2.750 | 072008 | XAST | 0.001 | 072020 | TARA | 0.001 |
| 072002 | NITR | 0.001 | 072009 | ALCA | 0.667 | 072020 | TESE | 4.000 |
| 072002 | PACA | 1.025 | 072009 | BAEM | 0.001 | 072021 | AGSM | 0.001 |
| 072002 | POMO | 0.001 | 072009 | EQFE | 0.833 | 072021 | AGST | 0.001 |
| 072002 | SAEX | 3.003 | 072009 | GNCH | 0.001 | 072021 | ALCA | 4.333 |
| 072002 | SCPU | 0.025 | 072009 | MELIL | 0.003 | 072021 | BAEM | 0.001 |
| 072002 | SCSC | 0.003 | 072009 | PHAU | 13.333 | 072021 | BRWI | 0.001 |
| 072002 | SOOC | 0.001 | 072009 | SAEX | 1.000 | 072021 | ELCA | 0.367 |
| 072002 | STPA | 0.001 | 072009 | SAGO | 31.667 | 072021 | GNCH | 0.033 |
| 072002 | TARA | 2.753 | 072009 | SOOC | 0.007 | 072021 | HOJU | 0.001 |
| 072002 | TESE | 0.001 | 072009 | TARA | 0.667 | 072021 | JUAR | 0.167 |
| 072002 | VEAM | 0.001 | 072009 | TESE | 3.833 | 072021 | JUBA | 0.333 |
| 072002 | XAST | 0.250 | 072010 | ALCA | 4.750 | 072021 | MELIL | 0.003 |
| 072003 | ACGR | 0.001 | 072010 | BASL | 1.750 | 072021 | MUAS | 3.000 |
| 072003 | ALCA | 3.667 | 072010 | SAEX | 0.255 | 072021 | PHAU | 3.000 |
| 072003 | ATCA | 0.001 | 072010 | SAGO | 0.025 | 072021 | PLANTAG | 0.001 |
| 072003 | BASL | 0.001 | 072010 | SPCR | 0.003 | 072021 | PLANTAG | 0.003 |
| 072003 | BRLN | 0.001 | 072010 | TARA | 1.003 | 072021 | POMO | 0.001 |
| 072003 | BRRU | 0.003 | 072010 | TESE | 56.250 | 072021 | RACY | 0.001 |
| 072003 | DYPE | 0.001 | 072012 | ALCA | 7.667 | 072021 | SAGO | 21.667 |
| 072003 | ENCELIA | 0.003 | 072012 | BRRU | 0.007 | 072021 | SCMA | 0.003 |
| 072003 | ENCELIA | 0.001 | 072012 | DYPE | 0.333 | 072021 | SCPU | 0.001 |
| 072003 | ERIN | 0.001 | 072012 | PRGL | 1.000 | 072021 | SOOC | 0.001 |
| 072003 | ERIOP | 0.003 | 072012 | SPCR | 0.003 | 072021 | TARA | 5.000 |
| 072003 | ISAC | 0.001 | 072012 | TARA | 31.667 | 072021 | TESE | 21.700 |
| 072003 | MENTZEL | 0.003 | 072012 | TESE | 2.667 | 072022 | COCA | 0.003 |
| 072003 | SAEX | 0.001 | 072014 | ALCA | 0.337 | 072022 | PHAU | 0.253 |
| 072003 | SPCO | 0.001 | 072014 | ASSP | 0.001 | 072022 | SAEX | 0.001 |
| 072003 | SPCR | 0.007 | 072014 | BRRU | 0.010 | 072022 | SAGO | 18.000 |
| 072003 | STPA | 0.001 | 072014 | DISP | 0.007 | 072022 | TARA | 66.250 |
| 072003 | TARA | 0.340 | 072014 | MELIL | 0.001 | 072026 | AGST | 0.007 |
| 072007 | ALCA | 0.001 | 072014 | PRGL | 0.001 | 072026 | JUAR | 0.001 |
| 072007 | EQFE | 12.500 | 072014 | TARA | 26.667 | 072026 | JUBA | 0.033 |

| | | | | | | | | |
|--------|----------|--------|--------|---------|--------|--------|----------|--------|
| 072026 | PHAU | 0.070 | 072032 | JUTO | 0.003 | 072039 | BASL | 1.250 |
| 072026 | POMO | 0.001 | 072032 | LEMO | 0.001 | 072039 | BRRU | 0.003 |
| 072026 | SAEX | 0.400 | 072032 | OEOH | 0.003 | 072039 | EQFE | 0.003 |
| 072026 | SCMA | 0.003 | 072032 | PACA | 0.001 | 072039 | LELA | 0.250 |
| 072026 | TARA | 0.400 | 072032 | PHAU | 1.033 | 072039 | PHAU | 0.125 |
| 072026 | TESE | 0.003 | 072032 | PHAU | 80.000 | 072039 | SAEX | 0.750 |
| 072027 | BRRU | 0.550 | 072032 | PLANTAG | 0.001 | 072039 | SONCHUS | 0.003 |
| 072027 | PHAU | 1.000 | 072032 | PLANTAG | 0.007 | 072039 | TARA | 80.000 |
| 072027 | SAGO | 2.500 | 072032 | SAEX | 11.000 | 072039 | TESE | 0.250 |
| 072027 | TARA | 5.500 | 072032 | SCMA | 0.001 | 072040 | BASL | 0.500 |
| 072028 | AGSE | 0.003 | 072032 | SOOC | 0.001 | 072040 | BRRU | 0.010 |
| 072028 | AGST | 3.778 | 072032 | TARA | 0.017 | 072040 | ERIGERON | 0.025 |
| 072028 | BAEM | 0.003 | 072032 | TYDO | 0.033 | 072040 | GUTIERRZ | 0.125 |
| 072028 | CAAQ | 0.753 | 072033 | BAEM | 10.017 | 072040 | SAGO | 0.753 |
| 072028 | EQAR | 0.250 | 072033 | CAAQ | 0.033 | 072040 | SPCR | 0.500 |
| 072028 | EQFE | 0.003 | 072033 | GNCH | 0.003 | 072040 | TARA | 23.000 |
| 072028 | GNCH | 0.005 | 072033 | MELIL | 1.667 | 072040 | TESE | 3.250 |
| 072028 | JUAR | 0.005 | 072033 | MUAS | 0.003 | 072041 | AGSE | 0.028 |
| 072028 | JUTO | 0.003 | 072033 | PHAU | 21.667 | 072041 | ALCA | 0.055 |
| 072028 | LEFR | 0.003 | 072033 | SAEX | 23.333 | 072041 | BAEM | 0.001 |
| 072028 | MELIL | 0.025 | 072033 | SCAC | 0.333 | 072041 | EQFE | 0.278 |
| 072028 | MUAS | 0.250 | 072033 | SCMA | 0.003 | 072041 | GNCH | 0.253 |
| 072028 | PACA | 0.001 | 072033 | SCP | 0.337 | 072041 | HOJU | 1.000 |
| 072028 | PHAU | 92.500 | 072033 | SOOC | 0.100 | 072041 | JUAR | 0.003 |
| 072028 | PLANTAG | 0.003 | 072033 | TARA | 2.033 | 072041 | JUBA | 0.250 |
| 072028 | POMO | 0.005 | 072035 | AGST | 0.003 | 072041 | JUTO | 0.003 |
| 072028 | SAEX | 0.003 | 072035 | BRLN | 0.001 | 072041 | MELIL | 2.500 |
| 072028 | SCAC | 0.250 | 072035 | EQFE | 0.125 | 072041 | MUAS | 0.003 |
| 072028 | SCMA | 0.005 | 072035 | GNCH | 0.005 | 072041 | POMO | 0.003 |
| 072028 | SCP | 0.025 | 072035 | MELIL | 0.500 | 072041 | SAEX | 3.900 |
| 072028 | SOOC | 2.500 | 072035 | OEOH | 0.003 | 072041 | TARA | 0.128 |
| 072028 | TARA | 1.278 | 072035 | PHAU | 2.500 | 072041 | TESE | 0.128 |
| 072028 | VEAM | 0.001 | 072035 | SAEX | 57.500 | 072041 | TYDO | 0.003 |
| 072030 | AGST | 7.000 | 072035 | SOOC | 0.875 | 072042 | ALCA | 1.628 |
| 072030 | ARGL | 0.033 | 072035 | TARA | 0.125 | 072042 | BRRU | 0.010 |
| 072030 | BAEM | 0.033 | 072036 | PHAU | 0.007 | 072042 | SAEX | 4.750 |
| 072030 | COCA | 0.033 | 072036 | SAGO | 23.333 | 072042 | SAEX | 4.500 |
| 072030 | ENCelia | 0.167 | 072036 | TARA | 55.000 | 072042 | SOOC | 0.028 |
| 072030 | GUTIERRZ | 0.067 | 072037 | ALCA | 5.000 | 072042 | SPCR | 0.253 |
| 072030 | HOJU | 0.333 | 072037 | BAEM | 3.750 | 072042 | TARA | 0.255 |
| 072030 | MELIL | 3.367 | 072037 | EQFE | 12.500 | 072042 | TESE | 57.500 |
| 072030 | MUAS | 26.667 | 072037 | PHAU | 2.875 | 072043 | ALCA | 3.003 |
| 072030 | POMO | 0.003 | 072037 | SAEX | 43.750 | 072043 | BAEM | 0.500 |
| 072030 | SAEX | 1.000 | 072037 | TARA | 5.250 | 072043 | BASL | 9.000 |
| 072030 | SCP | 0.167 | 072037 | TESE | 1.250 | 072043 | BRRU | 0.010 |
| 072030 | SOOC | 1.667 | 072038 | BAEM | 0.001 | 072043 | COCA | 0.003 |
| 072030 | SPCR | 0.667 | 072038 | BASL | 0.001 | 072043 | EQFE | 0.128 |
| 072030 | TARA | 1.667 | 072038 | EQFE | 0.625 | 072043 | GUTIERRZ | 0.875 |
| 072032 | AGST | 0.033 | 072038 | PHAU | 2.500 | 072043 | PRGL | 0.001 |
| 072032 | BAEM | 0.001 | 072038 | SAEX | 58.750 | 072043 | SAEX | 9.625 |
| 072032 | EQFE | 0.003 | 072038 | TARA | 0.625 | 072043 | SOOC | 0.500 |
| 072032 | GNCH | 0.033 | 072039 | BAEM | 0.001 | 072043 | SPFL | 0.525 |

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|--------|----------|--------|
| 072043 | TARA | 17.500 |
| 072043 | TESE | 8.250 |
| 072043 | TIQUILIA | 0.003 |
| 072044 | ALCA | 0.378 |
| 072044 | ASSP | 0.003 |
| 072044 | BASL | 20.250 |
| 072044 | BRRU | 0.008 |
| 072044 | GUTIERRZ | 0.001 |
| 072044 | PHAU | 0.378 |
| 072044 | PRGL | 1.750 |
| 072044 | SAEX | 2.500 |
| 072044 | SAGO | 0.003 |
| 072044 | SPCR | 0.630 |
| 072044 | STPI | 0.001 |
| 072044 | TARA | 11.250 |
| 072044 | TESE | 13.000 |
| 072048 | ALCA | 26.700 |
| 072048 | ASSP | 0.033 |
| 072048 | BRRU | 8.667 |
| 072048 | PRGL | 1.667 |
| 072048 | SAGO | 4.667 |
| 072048 | TARA | 10.000 |
| 072048 | TESE | 21.667 |

Vegetation Polygon Data
Site: 94 L

1997 Sampling Trip

| Polygon | Species | Cover | | | | | | |
|---------|----------|--------|--------|------|--------|--------|-------|--------|
| 094002 | AGSE | 0.775 | 094012 | POGR | 0.550 | 094037 | SPCR | 0.001 |
| 094002 | SAEX | 0.675 | 094012 | STPA | 0.055 | 094037 | TARA | 1.505 |
| 094002 | TESE | 0.001 | 094012 | TESE | 0.250 | 094039 | SPCR | 0.001 |
| 094002 | TYDO | 10.500 | 094018 | ASSP | 0.001 | 094045 | ARGL | 0.150 |
| 094003 | BAEM | 8.400 | 094018 | BRRU | 2.028 | 094045 | ARLU | 0.025 |
| 094003 | SAEX | 21.400 | 094018 | TARA | 33.750 | 094045 | BAEM | 0.250 |
| 094003 | TARA | 33.400 | 094018 | TESE | 37.550 | 094045 | BASL | 0.001 |
| 094004 | ACGR | 0.001 | 094024 | TARA | 0.002 | 094045 | BOBA | 0.003 |
| 094004 | AGSE | 1.000 | 094025 | ABEL | 0.001 | 094045 | BRCA | 0.500 |
| 094004 | BASL | 22.667 | 094025 | TESE | 0.800 | 094045 | BRLN | 0.001 |
| 094004 | BRLN | 0.067 | 094033 | BAEM | 0.001 | 094045 | DIBR | 0.125 |
| 094004 | BRRU | 0.001 | 094034 | ACGR | 0.001 | 094045 | ISAC | 1.500 |
| 094004 | COCA | 0.001 | 094034 | AGSE | 0.001 | 094045 | OEPA | 0.001 |
| 094004 | ERLO | 0.001 | 094034 | ALCA | 0.250 | 094045 | ORHY | 0.053 |
| 094004 | GNCH | 0.017 | 094034 | BAEM | 2.503 | 094045 | SPFL | 0.150 |
| 094004 | OPPH | 0.001 | 094034 | BOBA | 3.750 | 094045 | TARA | 0.001 |
| 094004 | PLMA | 0.003 | 094034 | ELST | 0.003 | 094050 | ALCA | 3.250 |
| 094004 | SETARIA | 0.167 | 094034 | EQFE | 1.250 | 094050 | BAEM | 1.775 |
| 094004 | TARA | 34.333 | 094034 | GNCH | 0.001 | 094050 | BOBA | 0.253 |
| 094004 | VEAM | 0.001 | 094034 | ISAC | 0.001 | 094050 | BRLN | 0.275 |
| 094006 | ACGR | 0.001 | 094034 | JUAR | 0.001 | 094050 | ISAC | 0.500 |
| 094006 | ASSP | 0.001 | 094034 | MUAS | 0.001 | 094050 | MUAS | 0.003 |
| 094006 | BAEM | 8.000 | 094034 | SAEX | 0.025 | 094050 | SPCR | 0.003 |
| 094006 | BRLN | 0.001 | 094034 | SAGO | 0.750 | 094050 | SPFL | 0.003 |
| 094006 | BRRI | 0.001 | 094034 | SCPU | 5.000 | 094050 | TARA | 1.005 |
| 094006 | BRRU | 0.025 | 094034 | SPCR | 0.001 | 094051 | ABEL | 0.001 |
| 094006 | ERCU | 0.001 | 094034 | TARA | 1.528 | 094051 | ALCA | 0.001 |
| 094006 | GUTIERRZ | 0.001 | 094034 | TESE | 0.001 | 094051 | BASL | 0.001 |
| 094006 | SAEX | 0.001 | 094034 | TYDO | 1.250 | 094051 | ISAC | 1.375 |
| 094006 | STPA | 0.001 | 094035 | ABEL | 0.001 | 094051 | MELIL | 0.001 |
| 094006 | TARA | 55.000 | 094035 | ALCA | 3.750 | 094051 | OEPA | 0.003 |
| 094006 | TESE | 1.263 | 094035 | BASL | 0.125 | 094051 | ORHY | 0.500 |
| 094010 | SAEX | 0.033 | 094035 | BOBA | 0.001 | 094051 | SPCO | 0.125 |
| 094010 | TESE | 0.037 | 094035 | BRLN | 0.001 | 094051 | SPFL | 0.003 |
| 094011 | ASSP | 0.250 | 094035 | CYDA | 0.513 | 094051 | TARA | 0.001 |
| 094011 | BAEM | 7.500 | 094035 | ISAC | 0.625 | 094053 | BAEM | 5.000 |
| 094011 | BASL | 0.001 | 094035 | ORHY | 0.001 | 094053 | TARA | 1.050 |
| 094011 | BRRI | 0.003 | 094035 | PAFI | 0.001 | 094053 | TESE | 67.500 |
| 094011 | BRRU | 0.075 | 094035 | PRGL | 0.003 | 094055 | AGSE | 0.025 |
| 094011 | MAPI | 0.250 | 094035 | SPCR | 0.003 | 094055 | ARLU | 0.001 |
| 094011 | TARA | 26.250 | 094035 | SPFL | 0.025 | 094055 | BAEM | 15.750 |
| 094011 | TESE | 33.750 | 094035 | TARA | 0.250 | 094055 | CYDA | 0.250 |
| 094012 | ACGR | 0.005 | 094035 | TARA | 9.000 | 094055 | EQFE | 1.003 |
| 094012 | ACWR | 0.001 | 094037 | ACGR | 0.001 | 094055 | FEPR | 0.500 |
| 094012 | BRRU | 0.100 | 094037 | BAEM | 0.001 | 094055 | ISAC | 0.025 |
| 094012 | ERLO | 0.025 | 094037 | BASL | 0.001 | 094055 | MELIL | 0.750 |
| 094012 | MAPI | 0.100 | 094037 | ISAC | 0.001 | 094055 | MUAS | 0.250 |
| 094012 | ORHY | 0.025 | 094037 | SAEX | 0.001 | 094055 | POMO | 0.001 |

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|--------|------|--------|
| 094055 | SAEX | 14.000 |
| 094055 | SOOC | 2.525 |
| 094055 | TARA | 9.250 |
| 094055 | TESE | 0.775 |

Vegetation Polygon Data
Site: 123 L

1997 Sampling Trip

| Polygon | Species | Cover | | | | | | | |
|---------|----------|--------|--------|----------|--------|--------|----------|--------|--|
| 123001 | BAEM | 0.001 | 123009 | PRGL | 0.003 | 123019 | BRLN | 0.001 | |
| 123001 | CYDA | 0.001 | 123009 | SAEX | 1.667 | 123019 | BROMUS | 1.515 | |
| 123001 | EQFE | 0.001 | 123012 | ACGR | 0.001 | 123019 | ENFA | 0.010 | |
| 123001 | MELIL | 0.001 | 123012 | BRLN | 5.167 | 123019 | ENFR | 0.015 | |
| 123001 | SAEX | 0.001 | 123012 | BROMUS | 0.433 | 123019 | EQFE | 0.050 | |
| 123001 | SOOC | 0.001 | 123012 | ISAC | 3.333 | 123019 | ERIGERON | 0.005 | |
| 123002 | ALCA | 0.001 | 123012 | MAAN | 0.170 | 123019 | ERIGERON | 0.005 | |
| 123002 | ASSP | 10.000 | 123012 | STPA | 1.367 | 123019 | GAST | 0.010 | |
| 123002 | BASL | 0.500 | 123013 | AGSE | 0.100 | 123019 | GUTIERRZ | 1.000 | |
| 123002 | BOBA | 0.001 | 123013 | BAEM | 0.100 | 123019 | HILARIA | 0.250 | |
| 123002 | CYDA | 0.001 | 123013 | BRLN | 0.300 | 123019 | ISAC | 0.410 | |
| 123002 | ENFA | 0.001 | 123013 | SAEX | 2.000 | 123019 | MAAN | 0.010 | |
| 123002 | EQFE | 0.008 | 123014 | ARGL | 0.020 | 123019 | MELIL | 0.005 | |
| 123002 | HILARIA | 0.025 | 123014 | ASSP | 8.000 | 123019 | POGR | 0.005 | |
| 123002 | ISAC | 0.500 | 123014 | BAEM | 7.600 | 123019 | SAEX | 2.400 | |
| 123002 | OPUNTIA | 0.001 | 123014 | BASE | 0.001 | 123019 | SCSC | 0.001 | |
| 123002 | PAVI | 1.250 | 123014 | BASL | 1.000 | 123019 | SOOC | 0.025 | |
| 123002 | SAEX | 11.250 | 123014 | BOBA | 0.100 | 123019 | SPCO | 0.010 | |
| 123002 | SPCO | 0.250 | 123014 | BRLN | 0.080 | 123019 | SPCR | 0.010 | |
| 123002 | TARA | 2.500 | 123014 | BROMUS | 0.920 | 123019 | SPFL | 0.010 | |
| 123002 | TESE | 4.500 | 123014 | CYDA | 0.200 | 123019 | SPHAER | 0.025 | |
| 123008 | AGSE | 0.001 | 123014 | ENFA | 0.001 | 123019 | STPA | 0.515 | |
| 123008 | ALCA | 0.033 | 123014 | EQFE | 0.001 | 123019 | TARA | 3.000 | |
| 123008 | ASSP | 1.000 | 123014 | GUTIERRZ | 0.060 | 123019 | YUCCA | 0.001 | |
| 123008 | BAEM | 0.333 | 123014 | ISAC | 1.042 | 123025 | CAAQ | 26.667 | |
| 123008 | BASE | 0.667 | 123014 | MAAN | 0.001 | 123025 | EQFE | 6.333 | |
| 123008 | BASL | 3.333 | 123014 | MELIL | 0.001 | 123025 | JUTO | 0.333 | |
| 123008 | BOBA | 0.167 | 123014 | SAEX | 4.600 | 123025 | PHAU | 23.333 | |
| 123008 | BRLN | 0.333 | 123014 | SOAS | 0.001 | 123025 | SAEX | 15.333 | |
| 123008 | CYDA | 6.333 | 123014 | SPCO | 0.100 | 123025 | SOOC | 11.700 | |
| 123008 | EQFE | 0.433 | 123014 | SPHAER | 0.001 | 123026 | ACGR | 0.003 | |
| 123008 | MELIL | 0.001 | 123014 | STPA | 0.001 | 123026 | BAEM | 0.500 | |
| 123008 | OEHO | 0.001 | 123014 | TARA | 15.600 | 123026 | BASL | 6.250 | |
| 123008 | RHTR | 0.001 | 123017 | AGST | 0.001 | 123026 | BROMUS | 0.028 | |
| 123008 | SAEX | 1.333 | 123017 | ASSP | 0.001 | 123026 | DIBR | 0.003 | |
| 123009 | ARGL | 0.003 | 123017 | BAEM | 7.202 | 123026 | EQFE | 0.750 | |
| 123009 | ARLU | 0.001 | 123017 | BROMUS | 0.610 | 123026 | GUTIERRZ | 0.375 | |
| 123009 | ASSP | 0.001 | 123017 | EQFE | 11.000 | 123026 | HILARIA | 0.125 | |
| 123009 | BAEM | 1.333 | 123017 | GNCH | 0.004 | 123026 | ISAC | 0.125 | |
| 123009 | BASL | 4.333 | 123017 | MELIL | 0.022 | 123026 | OEPA | 0.125 | |
| 123009 | BOBA | 5.000 | 123017 | OEHO | 0.010 | 123026 | ORHY | 0.001 | |
| 123009 | BRLN | 0.167 | 123017 | SAEX | 43.000 | 123026 | PHAU | 0.750 | |
| 123009 | BROMUS | 0.001 | 123017 | SOAS | 0.004 | 123026 | SAEX | 11.250 | |
| 123009 | CYDA | 2.667 | 123017 | SOOC | 4.110 | 123026 | SOOC | 0.250 | |
| 123009 | GUTIERRZ | 0.333 | 123017 | TARA | 4.210 | 123026 | SPCR | 0.005 | |
| 123009 | ISAC | 0.033 | 123019 | ARGL | 2.500 | 123026 | SPHAER | 0.003 | |
| 123009 | MELIL | 1.667 | 123019 | ASSP | 0.200 | 123026 | TARA | 7.750 | |
| 123009 | OPUNTIA | 6.000 | 123019 | BOBR | 0.005 | 123026 | TESE | 16.500 | |

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|--------|----------|--------|--------|----------|--------|--------|----------|--------|
| 123027 | ACGR | 0.002 | 123033 | TARA | 1.003 | 123041 | POAN | 0.003 |
| 123027 | ARGL | 0.002 | 123034 | HILARIA | 0.025 | 123041 | POMO | 0.007 |
| 123027 | ARLU | 0.200 | 123034 | SAEX | 3.750 | 123041 | SAEX | 5.000 |
| 123027 | ASSP | 1.100 | 123034 | TARA | 0.250 | 123041 | SOAS | 0.003 |
| 123027 | BASL | 8.040 | 123034 | TESE | 0.250 | 123041 | SOOC | 0.001 |
| 123027 | BROMUS | 4.212 | 123035 | SAEX | 0.001 | 123041 | TARA | 0.001 |
| 123027 | EQFE | 5.400 | 123035 | TESE | 0.001 | 123042 | ARGL | 0.001 |
| 123027 | GUTIERRZ | 0.020 | 123036 | ASSU | 0.003 | 123042 | ARLU | 0.005 |
| 123027 | ISAC | 0.700 | 123036 | BROMUS | 0.028 | 123042 | ASSU | 0.003 |
| 123027 | MELIL | 0.001 | 123036 | BROMUS | 0.003 | 123042 | BAEM | 0.513 |
| 123027 | MUAS | 0.001 | 123036 | BROMUS | 0.003 | 123042 | BASE | 0.001 |
| 123027 | OEHO | 0.004 | 123036 | EQFE | 0.500 | 123042 | BASE | 0.001 |
| 123027 | OEPA | 0.001 | 123036 | ISAC | 0.500 | 123042 | BASL | 0.250 |
| 123027 | ORHY | 0.014 | 123036 | SAEX | 1.000 | 123042 | BRLN | 2.625 |
| 123027 | PHAU | 3.000 | 123036 | TARA | 75.000 | 123042 | BROMUS | 0.003 |
| 123027 | SAEX | 15.000 | 123037 | ARGL | 0.025 | 123042 | COCA | 0.005 |
| 123027 | SOOC | 0.040 | 123037 | ASSP | 0.250 | 123042 | EPNE | 0.001 |
| 123027 | SPCR | 0.334 | 123037 | BROMUS | 0.008 | 123042 | EQFE | 0.128 |
| 123027 | STPA | 0.002 | 123037 | BROMUS | 0.003 | 123042 | GNCH | 0.005 |
| 123027 | TARA | 7.000 | 123037 | BROMUS | 0.003 | 123042 | GUTIERRZ | 0.001 |
| 123028 | ACGR | 0.001 | 123037 | GUTIERRZ | 0.025 | 123042 | ISAC | 0.750 |
| 123028 | ARGL | 0.378 | 123037 | HILARIA | 0.250 | 123042 | MELIL | 0.008 |
| 123028 | ARLU | 0.003 | 123037 | ISAC | 6.500 | 123042 | MUAS | 0.505 |
| 123028 | BASL | 0.001 | 123037 | ORHY | 1.250 | 123042 | OEPA | 0.005 |
| 123028 | BEJU | 0.050 | 123037 | SPCR | 0.003 | 123042 | ORHY | 0.001 |
| 123028 | BOBA | 0.025 | 123037 | STPA | 0.025 | 123042 | POMO | 0.001 |
| 123028 | BROMUS | 0.003 | 123037 | STPA | 0.025 | 123042 | SAEX | 0.001 |
| 123028 | ERIN | 0.003 | 123037 | TESE | 0.500 | 123042 | SOAS | 0.001 |
| 123028 | GAST | 0.025 | 123039 | ASSP | 0.001 | 123042 | SPCR | 0.008 |
| 123028 | GUTIERRZ | 1.050 | 123039 | BAEM | 0.001 | 123042 | SPHAER | 0.001 |
| 123028 | HILARIA | 1.000 | 123039 | BROMUS | 0.025 | 123042 | STPA | 0.001 |
| 123028 | ISAC | 4.250 | 123039 | CYDA | 0.250 | 123042 | TARA | 9.000 |
| 123028 | MAPI | 0.001 | 123039 | EQFE | 6.000 | 123043 | ACGR | 0.001 |
| 123028 | OPUNTIA | 0.001 | 123039 | ORHY | 0.001 | 123043 | ARGL | 0.001 |
| 123028 | POGR | 0.125 | 123039 | POAN | 0.001 | 123043 | BOBA | 0.001 |
| 123028 | SAIB | 0.001 | 123039 | SAEX | 31.250 | 123043 | BRLN | 0.040 |
| 123028 | SCSC | 0.025 | 123039 | SOOC | 0.250 | 123043 | BROMUS | 2.800 |
| 123028 | SPCR | 0.003 | 123039 | SPCO | 0.100 | 123043 | CYDA | 0.020 |
| 123028 | SPHAER | 0.050 | 123039 | TARA | 3.500 | 123043 | EQFE | 0.004 |
| 123028 | STPA | 0.375 | 123041 | AGSE | 0.067 | 123043 | ERIN | 0.001 |
| 123028 | TARA | 0.750 | 123041 | AMAC | 0.001 | 123043 | GUTIERRZ | 0.001 |
| 123028 | TESE | 0.250 | 123041 | BRLN | 0.001 | 123043 | ISAC | 1.000 |
| 123028 | TRMU | 0.025 | 123041 | BROMUS | 0.003 | 123043 | MAPI | 0.001 |
| 123028 | YUCCA | 0.025 | 123041 | COCA | 0.007 | 123043 | OPUNTIA | 0.001 |
| 123029 | ACGR | 0.033 | 123041 | CYDA | 1.033 | 123043 | SAEX | 1.600 |
| 123029 | ARGL | 0.001 | 123041 | DYPE | 0.003 | 123043 | SPCO | 1.600 |
| 123029 | BROMUS | 0.070 | 123041 | EQFE | 0.003 | 123043 | SPCR | 0.001 |
| 123029 | ISAC | 1.000 | 123041 | GNCH | 0.170 | 123043 | SPHAER | 0.001 |
| 123029 | SAEX | 0.500 | 123041 | ISAC | 0.007 | 123043 | STPA | 0.020 |
| 123029 | STPA | 0.200 | 123041 | MELIL | 0.367 | 123043 | TARA | 15.000 |
| 123029 | TESE | 70.000 | 123041 | OEPA | 0.337 | 123044 | ABEL | 0.001 |
| 123033 | SAEX | 0.153 | 123041 | PLMA | 0.003 | 123044 | BRLN | 0.001 |

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|--------|---------|-------|--------|----------|-------|--------|----------|-------|
| 123044 | BROMUS | 0.025 | 123050 | SAIB | 0.001 | 123053 | ENFA | 0.001 |
| 123044 | BROMUS | 4.300 | 123050 | SOAS | 0.004 | 123053 | GUTIERRZ | 0.025 |
| 123044 | BROMUS | 0.525 | 123050 | SPHAER | 0.001 | 123053 | HILARIA | 0.025 |
| 123044 | DIBR | 0.001 | 123050 | TARA | 1.220 | 123053 | ISAC | 0.025 |
| 123044 | EQFE | 0.001 | 123050 | VEAN | 0.002 | 123053 | OEPA | 0.001 |
| 123044 | ISAC | 2.125 | 123051 | ACGR | 0.008 | 123053 | ORHY | 0.250 |
| 123044 | OEPA | 0.003 | 123051 | BAEM | 0.200 | 123053 | SAEX | 0.250 |
| 123044 | OPUNTIA | 0.001 | 123051 | BASL | 0.001 | 123053 | SPCO | 0.001 |
| 123044 | ORHY | 0.775 | 123051 | BOBA | 0.022 | 123053 | SPHAER | 0.003 |
| 123044 | SAEX | 0.001 | 123051 | BRLN | 4.000 | 123053 | TARA | 0.625 |
| 123044 | SAIB | 0.001 | 123051 | BROMUS | 0.042 | 123057 | BRLN | 0.167 |
| 123044 | SPCO | 1.075 | 123051 | CAMU | 0.001 | 123057 | CRBA | 0.001 |
| 123044 | SPHAER | 0.003 | 123051 | COCA | 0.002 | 123057 | ORHY | 0.001 |
| 123044 | SPHAER | 0.003 | 123051 | DASE | 0.001 | 123057 | TARA | 0.001 |
| 123049 | ACGR | 0.001 | 123051 | DAWR | 0.040 | 123058 | ACGR | 0.001 |
| 123049 | AGSE | 0.001 | 123051 | DIBR | 0.024 | 123058 | ARGL | 0.100 |
| 123049 | ALCA | 0.001 | 123051 | DYPE | 0.004 | 123058 | BASE | 0.220 |
| 123049 | AMAC | 0.001 | 123051 | ENFA | 0.002 | 123058 | BRLN | 0.420 |
| 123049 | ARLU | 0.001 | 123051 | ERIN | 0.020 | 123058 | DYPE | 0.001 |
| 123049 | BAEM | 0.003 | 123051 | ISAC | 0.044 | 123058 | GNCH | 0.002 |
| 123049 | BASL | 0.001 | 123051 | MENTZEL | 0.002 | 123058 | GUTIERRZ | 0.001 |
| 123049 | BOBA | 0.003 | 123051 | OEPA | 0.001 | 123058 | MELIL | 0.002 |
| 123049 | BRLN | 0.378 | 123051 | ORHY | 0.020 | 123058 | ORHY | 0.001 |
| 123049 | CRBA | 0.003 | 123051 | SAIB | 0.420 | 123058 | POGR | 0.001 |
| 123049 | DAWR | 0.001 | 123051 | SPCO | 0.004 | 123058 | SCSC | 0.001 |
| 123049 | DIBR | 0.001 | 123051 | SPCR | 0.002 | 123058 | STPA | 0.001 |
| 123049 | DISP | 0.001 | 123051 | SPHAER | 0.001 | 123061 | ARGL | 0.033 |
| 123049 | ERCI | 0.001 | 123051 | STPA | 0.046 | 123061 | BASE | 0.333 |
| 123049 | GNCH | 0.003 | 123051 | TARA | 0.001 | 123061 | BOBA | 0.001 |
| 123049 | HEOB | 0.003 | 123051 | TARA | 0.200 | 123061 | HILARIA | 0.007 |
| 123049 | MENTZEL | 0.001 | 123051 | TIDESTR | 0.001 | 123061 | ORHY | 0.001 |
| 123049 | OEOH | 0.001 | 123052 | ALCA | 0.125 | 123061 | TESE | 2.667 |
| 123049 | ORHY | 0.003 | 123052 | ARGL | 0.001 | 123062 | BASL | 0.001 |
| 123049 | POMO | 0.003 | 123052 | BASL | 0.001 | 123062 | SPFL | 0.001 |
| 123049 | SAEX | 0.253 | 123052 | BOBA | 0.001 | 123062 | TESE | 0.050 |
| 123049 | SPCR | 0.028 | 123052 | BRLN | 0.625 | 123063 | ACGR | 0.001 |
| 123049 | TARA | 0.778 | 123052 | DIBR | 0.001 | 123063 | AGSE | 0.001 |
| 123050 | AGSE | 0.010 | 123052 | DYPE | 0.001 | 123063 | BOBA | 0.003 |
| 123050 | BAEM | 0.200 | 123052 | ENFA | 0.001 | 123063 | COCA | 0.001 |
| 123050 | BASE | 0.004 | 123052 | ERDE | 0.003 | 123063 | DIBR | 0.625 |
| 123050 | BASL | 0.600 | 123052 | GUTIERRZ | 0.001 | 123063 | GUTIERRZ | 0.025 |
| 123050 | BRLN | 0.001 | 123052 | HILARIA | 0.001 | 123063 | HECU | 0.001 |
| 123050 | BROMUS | 0.001 | 123052 | ISAC | 0.128 | 123063 | HILARIA | 0.003 |
| 123050 | COCA | 0.006 | 123052 | ORHY | 0.001 | 123063 | ISAC | 0.125 |
| 123050 | DAWR | 0.008 | 123052 | SAEX | 0.001 | 123063 | SPCO | 0.025 |
| 123050 | EUPHORB | 0.001 | 123052 | SPCR | 0.003 | 123063 | TARA | 0.005 |
| 123050 | GNCH | 0.002 | 123052 | SPHAER | 0.001 | 123064 | BASE | 0.001 |
| 123050 | JUTO | 0.001 | 123052 | TARA | 1.400 | 123064 | BRLN | 0.150 |
| 123050 | MUAS | 0.001 | 123052 | TESE | 0.025 | 123064 | DIBR | 0.128 |
| 123050 | OEPA | 0.001 | 123052 | TRMU | 0.001 | 123064 | ISAC | 0.375 |
| 123050 | POMO | 0.208 | 123053 | BRLN | 0.001 | 123064 | OEPA | 0.003 |
| 123050 | SAEX | 1.002 | 123053 | DIBR | 0.001 | 123064 | ORHY | 0.053 |

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|--------|------|-------|
| 123064 | PRGL | 0.003 |
| 123064 | SPCO | 0.025 |
| 123064 | SPCR | 0.025 |
| 123064 | SPFL | 0.003 |
| 123064 | STPA | 0.025 |
| 123064 | TARA | 3.275 |

Vegetation Polygon Data
Site: 194 L

1997 Sampling Trip

| Polygon | Species | Cover | | | | | | |
|---------|---------|--------|--------|----------|--------|--------|---------|--------|
| 194003 | AGST | 0.001 | 194007 | BROMUS | 0.002 | 194013 | SAIB | 0.001 |
| 194003 | ARLU | 0.001 | 194007 | BRWI | 0.020 | 194013 | SOOC | 0.250 |
| 194003 | ASSU | 0.250 | 194007 | CYDA | 18.600 | 194013 | SPAI | 0.001 |
| 194003 | BAEM | 0.001 | 194007 | ISAC | 1.400 | 194013 | SPCR | 0.275 |
| 194003 | BASL | 0.250 | 194007 | PRGL | 0.001 | 194013 | SPFL | 0.001 |
| 194003 | CYDA | 22.550 | 194007 | SOAS | 0.002 | 194013 | TARA | 33.250 |
| 194003 | EQFE | 1.525 | 194007 | TARA | 54.000 | 194013 | TYDO | 2.000 |
| 194003 | GNCH | 0.003 | 194007 | TESE | 0.001 | 194014 | BAEM | 0.167 |
| 194003 | JUTO | 0.001 | 194012 | ALCA | 0.220 | 194014 | CAAQ | 0.001 |
| 194003 | MELIL | 1.150 | 194012 | AMAC | 9.400 | 194014 | CHNI | 0.001 |
| 194003 | MUAS | 0.001 | 194012 | BASA | 0.800 | 194014 | COCA | 0.001 |
| 194003 | PHAU | 0.001 | 194012 | COCA | 0.001 | 194014 | CYDA | 1.667 |
| 194003 | POMO | 0.001 | 194012 | CYDA | 0.120 | 194014 | DICORIA | 0.667 |
| 194003 | SAEX | 5.250 | 194012 | DAWR | 0.001 | 194014 | ECCR | 0.167 |
| 194003 | SCAC | 0.003 | 194012 | HOJU | 0.001 | 194014 | EQFE | 0.001 |
| 194003 | SCMA | 0.125 | 194012 | MUAS | 0.001 | 194014 | GNCH | 0.001 |
| 194003 | SCPU | 3.800 | 194012 | PHAU | 0.001 | 194014 | OEHO | 0.001 |
| 194003 | SCSC | 0.025 | 194012 | POA | 0.001 | 194014 | PACA | 0.167 |
| 194003 | SOOC | 0.025 | 194012 | POMO | 0.001 | 194014 | PHAU | 1.333 |
| 194003 | TARA | 0.003 | 194012 | SAEX | 5.600 | 194014 | SAEX | 28.333 |
| 194003 | TYDO | 15.000 | 194012 | SAIB | 0.001 | 194014 | SCMA | 0.003 |
| 194004 | ACGR | 0.003 | 194012 | SPCR | 0.200 | 194014 | SPCR | 0.333 |
| 194004 | ASSP | 1.037 | 194012 | TARA | 1.400 | 194014 | TARA | 2.667 |
| 194004 | BASA | 4.667 | 194013 | AMAC | 0.125 | 194014 | TYDO | 0.001 |
| 194004 | BOBA | 0.333 | 194013 | ANGL | 0.075 | 194015 | ANGL | 0.125 |
| 194004 | BROMUS | 0.670 | 194013 | ARLU | 0.038 | 194015 | ASSU | 0.003 |
| 194004 | CRYPTAN | 0.003 | 194013 | ASSU | 0.020 | 194015 | BASA | 0.500 |
| 194004 | CYDA | 33.367 | 194013 | BAEM | 2.750 | 194015 | BOBA | 0.500 |
| 194004 | ISAC | 0.667 | 194013 | BASA | 1.000 | 194015 | COCA | 0.001 |
| 194004 | SPCR | 0.037 | 194013 | BRLN | 0.008 | 194015 | CYDA | 15.000 |
| 194004 | TARA | 26.667 | 194013 | CEIN | 0.001 | 194015 | EQFE | 0.325 |
| 194005 | ACGR | 0.001 | 194013 | CHVI | 0.001 | 194015 | JUBA | 0.250 |
| 194005 | ARGL | 0.167 | 194013 | COCA | 0.163 | 194015 | JUTO | 0.001 |
| 194005 | ASSP | 0.367 | 194013 | DAWR | 0.001 | 194015 | MUAS | 55.250 |
| 194005 | BASA | 13.367 | 194013 | DICORIA | 0.300 | 194015 | PADI | 0.750 |
| 194005 | BOBA | 0.667 | 194013 | DYPE | 0.003 | 194015 | PHAU | 4.250 |
| 194005 | BRLN | 1.000 | 194013 | ECCR | 0.001 | 194015 | SAEX | 16.250 |
| 194005 | BROMUS | 0.003 | 194013 | EQFE | 2.005 | 194015 | SARA | 0.001 |
| 194005 | BROMUS | 1.867 | 194013 | ERIGERON | 0.028 | 194015 | SCMA | 0.001 |
| 194005 | CYDA | 3.333 | 194013 | GNCH | 0.200 | 194015 | SOOC | 1.500 |
| 194005 | ISAC | 1.003 | 194013 | MELIL | 0.001 | 194015 | TARA | 0.500 |
| 194005 | SPCR | 0.433 | 194013 | MUAS | 3.753 | 194015 | TYDO | 0.500 |
| 194005 | TARA | 16.667 | 194013 | OEHO | 0.001 | 194016 | ANGL | 0.001 |
| 194007 | ARLU | 0.001 | 194013 | PADI | 1.250 | 194016 | CYDA | 0.200 |
| 194007 | ASSP | 1.400 | 194013 | PHAU | 0.025 | 194016 | EQFE | 0.020 |
| 194007 | BASA | 2.800 | 194013 | PLMA | 0.130 | 194016 | GNCH | 0.002 |
| 194007 | BROMUS | 0.001 | 194013 | PRGL | 0.001 | 194016 | JUAR | 0.001 |
| 194007 | BROMUS | 2.800 | 194013 | SAEX | 0.275 | 194016 | JUBA | 0.001 |

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|--------|----------|--------|--------|----------|--------|--------|----------|--------|
| 194016 | JUTO | 0.001 | 194022 | PLMA | 0.008 | 194025 | SOOC | 0.075 |
| 194016 | MELIL | 0.001 | 194022 | PLPU | 0.008 | 194025 | SPCR | 0.250 |
| 194016 | MUAS | 1.000 | 194022 | POGR | 0.050 | 194025 | TARA | 12.125 |
| 194016 | PADI | 0.001 | 194022 | SAEX | 0.100 | 194025 | TESE | 0.250 |
| 194016 | PHAU | 10.000 | 194022 | SAIB | 0.500 | 194028 | ALCA | 0.033 |
| 194016 | POMO | 0.001 | 194022 | SOAS | 0.003 | 194028 | BASA | 3.333 |
| 194016 | SAEX | 1.600 | 194022 | SPCR | 0.875 | 194028 | BROMUS | 0.337 |
| 194016 | TARA | 0.600 | 194022 | TARA | 26.250 | 194028 | BROMUS | 0.007 |
| 194016 | TYDO | 66.000 | 194022 | VEBR | 0.075 | 194028 | COCA | 0.001 |
| 194018 | ALCA | 0.025 | 194022 | VETH | 0.003 | 194028 | CYDA | 28.333 |
| 194018 | BASA | 0.500 | 194022 | XAST | 0.750 | 194028 | EQFE | 10.000 |
| 194018 | COCA | 0.001 | 194023 | ALCA | 0.001 | 194028 | SAEX | 3.000 |
| 194018 | CYDA | 0.125 | 194023 | AMAC | 0.525 | 194028 | SOOC | 0.167 |
| 194018 | MELIL | 0.001 | 194023 | CHNI | 0.125 | 194028 | TARA | 40.000 |
| 194018 | MUAS | 0.001 | 194023 | CYDA | 0.025 | 194029 | BROMUS | 0.055 |
| 194018 | SAEX | 3.500 | 194023 | DICORIA | 0.875 | 194029 | CYDA | 1.500 |
| 194018 | TARA | 50.000 | 194023 | SAIB | 0.250 | 194029 | DICORIA | 0.250 |
| 194019 | CYDA | 0.500 | 194023 | TARA | 35.000 | 194029 | SAEX | 7.500 |
| 194019 | DICORIA | 0.750 | 194024 | AGST | 0.001 | 194029 | TARA | 1.000 |
| 194019 | PRGL | 0.250 | 194024 | ALCA | 0.001 | 194030 | ACGR | 0.167 |
| 194019 | SAIB | 5.000 | 194024 | ASSP | 1.000 | 194030 | ASSP | 0.033 |
| 194019 | XAST | 0.500 | 194024 | BAEM | 0.200 | 194030 | BASA | 5.667 |
| 194020 | BAEM | 0.001 | 194024 | BASA | 0.500 | 194030 | BROMUS | 0.001 |
| 194020 | TARA | 59.000 | 194024 | BROMUS | 0.005 | 194030 | BROMUS | 27.333 |
| 194021 | AMAC | 0.001 | 194024 | COCA | 0.001 | 194030 | COCA | 0.003 |
| 194021 | BAEM | 1.667 | 194024 | CYDA | 32.500 | 194030 | CYDA | 0.001 |
| 194021 | BASA | 0.667 | 194024 | EQFE | 5.875 | 194030 | DICORIA | 0.001 |
| 194021 | CYDA | 0.033 | 194024 | ERIGERON | 0.075 | 194030 | EQFE | 0.001 |
| 194021 | DICORIA | 0.167 | 194024 | MELIL | 0.175 | 194030 | GUTIERRZ | 0.003 |
| 194021 | TARA | 55.000 | 194024 | PRGL | 0.750 | 194030 | SAEX | 0.001 |
| 194022 | AMAC | 2.050 | 194024 | SAEX | 0.750 | 194030 | SPCO | 0.003 |
| 194022 | ANGL | 0.050 | 194024 | SOAS | 0.001 | 194030 | TARA | 45.000 |
| 194022 | ARLU | 0.125 | 194024 | SPCR | 0.005 | 194030 | TESE | 0.001 |
| 194022 | ASSU | 0.130 | 194024 | SPCR | 0.108 | 194031 | DICORIA | 0.500 |
| 194022 | BAEM | 0.005 | 194024 | TARA | 10.500 | 194031 | SPGI | 0.100 |
| 194022 | BAHY | 0.003 | 194024 | TESE | 11.450 | 194031 | TESE | 5.000 |
| 194022 | BOBA | 0.100 | 194025 | ACGR | 0.003 | 194032 | ALCA | 0.001 |
| 194022 | BRLN | 0.005 | 194025 | AGST | 0.005 | 194032 | BROMUS | 3.400 |
| 194022 | CHNI | 0.050 | 194025 | ALCA | 0.025 | 194032 | BROMUS | 0.010 |
| 194022 | COCA | 0.050 | 194025 | ASSP | 0.200 | 194032 | CYDA | 0.001 |
| 194022 | CYDA | 1.500 | 194025 | BASA | 9.300 | 194032 | DICORIA | 0.001 |
| 194022 | DICORIA | 2.925 | 194025 | BASL | 0.075 | 194032 | EQFE | 0.003 |
| 194022 | ENFA | 0.050 | 194025 | BROMUS | 0.008 | 194032 | SPCO | 0.467 |
| 194022 | ERIGERON | 0.008 | 194025 | BROMUS | 0.028 | 194032 | SPCR | 0.001 |
| 194022 | ERIGERON | 0.003 | 194025 | COCA | 0.153 | 194032 | TARA | 21.667 |
| 194022 | GNCH | 0.205 | 194025 | CYDA | 5.275 | 194032 | TESE | 11.000 |
| 194022 | GUTIERRZ | 0.013 | 194025 | EQFE | 0.010 | 194033 | ALCA | 0.001 |
| 194022 | MELIL | 0.013 | 194025 | ERIGERON | 0.013 | 194033 | BROMUS | 4.033 |
| 194022 | MUAS | 0.750 | 194025 | GNCH | 0.003 | 194033 | BROMUS | 0.070 |
| 194022 | OEOH | 0.100 | 194025 | PADI | 13.750 | 194033 | CYDA | 1.700 |
| 194022 | OEPA | 0.038 | 194025 | SAEX | 0.175 | 194033 | DICORIA | 0.001 |
| 194022 | PACA | 1.000 | 194025 | SOAS | 0.010 | 194033 | SPCR | 0.001 |

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|--------|----------|--------|--------|----------|--------|--------|---------|--------|
| 194033 | TARA | 71.667 | 194041 | DICORIA | 0.002 | 194061 | COCA | 0.220 |
| 194033 | TESE | 2.667 | 194041 | EQFE | 0.200 | 194061 | DICORIA | 0.200 |
| 194034 | BROMUS | 1.050 | 194041 | EQFE | 0.001 | 194061 | ECCR | 0.200 |
| 194034 | BROMUS | 0.005 | 194041 | GNCH | 0.001 | 194061 | EQFE | 5.220 |
| 194034 | BROMUS | 0.055 | 194041 | IMBR | 0.001 | 194061 | GNCH | 0.100 |
| 194034 | DICORIA | 0.005 | 194041 | SAEX | 0.001 | 194061 | HECU | 0.020 |
| 194034 | SPCR | 0.001 | 194041 | SOOC | 0.001 | 194061 | JUBA | 0.001 |
| 194035 | ACGR | 0.001 | 194041 | STPI | 0.002 | 194061 | JUEN | 0.200 |
| 194035 | ASSP | 0.001 | 194041 | TARA | 66.000 | 194061 | JUTO | 0.002 |
| 194035 | BASA | 0.001 | 194041 | TESE | 0.020 | 194061 | MELIL | 0.001 |
| 194035 | BROMUS | 1.000 | 194041 | TYDO | 0.001 | 194061 | MUAS | 0.060 |
| 194035 | BROMUS | 5.000 | 194041 | XAST | 0.001 | 194061 | MURI | 0.001 |
| 194035 | CYDA | 20.000 | 194042 | ACGR | 1.670 | 194061 | NITR | 0.001 |
| 194035 | TARA | 70.000 | 194042 | ASSP | 0.667 | 194061 | OEHO | 0.020 |
| 194036 | ALCA | 2.733 | 194042 | BASA | 46.667 | 194061 | PACA | 0.100 |
| 194036 | BROMUS | 0.007 | 194042 | BEJU | 0.167 | 194061 | PHAU | 0.001 |
| 194036 | BROMUS | 0.083 | 194042 | BRLN | 0.167 | 194061 | PLMA | 0.024 |
| 194036 | CYDA | 0.033 | 194042 | BROMUS | 2.033 | 194061 | POMO | 0.001 |
| 194036 | DICORIA | 5.667 | 194042 | BROMUS | 0.033 | 194061 | SAEX | 3.100 |
| 194036 | MAPI | 0.167 | 194042 | BROMUS | 0.370 | 194061 | SCPU | 1.610 |
| 194036 | SAIB | 0.400 | 194042 | CYDA | 0.837 | 194061 | SOAS | 0.001 |
| 194036 | SPCR | 1.670 | 194042 | EQFE | 0.007 | 194061 | SOLANUM | 0.001 |
| 194036 | TESE | 0.001 | 194042 | GUTIERRZ | 1.500 | 194061 | SPFL | 0.640 |
| 194040 | ACGR | 0.003 | 194042 | OPUNTIA | 0.001 | 194061 | TARA | 2.040 |
| 194040 | ANGL | 0.003 | 194042 | SPCR | 0.003 | 194061 | TYDO | 31.000 |
| 194040 | ARLU | 0.003 | 194042 | STPA | 0.033 | 194061 | VEBR | 0.001 |
| 194040 | ASSP | 18.337 | 194051 | BROMUS | 0.500 | 194072 | ACGR | 0.001 |
| 194040 | BAEM | 0.003 | 194051 | BROMUS | 0.500 | 194072 | ANGL | 0.001 |
| 194040 | BASA | 0.003 | 194051 | CYDA | 1.000 | 194072 | ARLU | 0.001 |
| 194040 | BROMUS | 0.001 | 194051 | PRGL | 0.001 | 194072 | ASSP | 0.001 |
| 194040 | COCA | 0.003 | 194051 | TARA | 2.500 | 194072 | BAEM | 0.001 |
| 194040 | CYDA | 10.003 | 194053 | ACGR | 0.500 | 194072 | BASA | 0.001 |
| 194040 | EQFE | 3.340 | 194053 | AGST | 0.001 | 194072 | COCA | 0.001 |
| 194040 | FESTUCA | 0.003 | 194053 | BRLN | 0.001 | 194072 | CYDA | 0.001 |
| 194040 | GUTIERRZ | 0.001 | 194053 | BROMUS | 0.003 | 194072 | EQFE | 0.001 |
| 194040 | MAPI | 0.001 | 194053 | BROMUS | 0.003 | 194072 | FESTUCA | 0.001 |
| 194040 | MELIL | 0.003 | 194053 | BROMUS | 0.005 | 194072 | MELIL | 0.001 |
| 194040 | OEHO | 0.003 | 194053 | COCA | 0.001 | 194072 | OEHO | 0.001 |
| 194040 | RUMEX | 0.003 | 194053 | CYDA | 27.500 | 194072 | RUMEX | 0.001 |
| 194040 | SOOC | 0.003 | 194053 | EQFE | 0.001 | 194072 | SOOC | 0.001 |
| 194040 | TARA | 0.003 | 194053 | GNCH | 0.001 | 194072 | TARA | 0.001 |
| 194040 | XAST | 0.001 | 194053 | SAGO | 0.001 | 194075 | ACGR | 1.000 |
| 194041 | ACGR | 0.020 | 194053 | SOAS | 0.001 | 194075 | AGST | 0.050 |
| 194041 | ANGL | 0.001 | 194053 | TARA | 86.250 | 194075 | BROMUS | 7.500 |
| 194041 | ASSP | 1.000 | 194053 | TESE | 3.875 | 194075 | PRGL | 2.500 |
| 194041 | BAEM | 0.100 | 194060 | AGST | 0.050 | 194075 | STPI | 1.050 |
| 194041 | BASA | 3.000 | 194060 | TARA | 0.001 | 194075 | TARA | 1.000 |
| 194041 | BROMUS | 0.002 | 194060 | TYDO | 45.000 | 194075 | TESE | 20.000 |
| 194041 | BROMUS | 0.200 | 194061 | AGST | 0.002 | | | |
| 194041 | BROMUS | 0.002 | 194061 | ARLU | 0.001 | | | |
| 194041 | COCA | 0.002 | 194061 | BAEM | 0.004 | | | |
| 194041 | CYDA | 4.100 | 194061 | BRLN | 0.020 | | | |

Vegetation Polygon Data
Site: 194 L

1997 Sampling Trip

| Polygon | Species | Cover | | | | | | |
|---------|----------|--------|--------|----------|--------|--------|--------|--------|
| 209002 | ALCA | 10.750 | 209005 | BOBA | 0.003 | 209021 | CYDA | 13.950 |
| 209002 | AMAC | 0.001 | 209005 | BROMUS | 0.107 | 209021 | ISAC | 0.013 |
| 209002 | ANGL | 0.001 | 209005 | CYDA | 2.667 | 209021 | MELIL | 0.143 |
| 209002 | ASSP | 0.001 | 209005 | DYPE | 0.003 | 209021 | PACA | 0.001 |
| 209002 | ASSU | 0.075 | 209005 | ENFA | 0.003 | 209021 | PRGL | 2.638 |
| 209002 | BAEM | 0.001 | 209005 | GUTIERRZ | 0.003 | 209021 | SPCR | 0.013 |
| 209002 | BASA | 6.250 | 209005 | ISAC | 0.001 | 209021 | SPFL | 0.001 |
| 209002 | BOBA | 0.001 | 209005 | OPUNTIA | 0.043 | 209021 | SPGI | 0.018 |
| 209002 | COCA | 0.075 | 209005 | SPHAER | 0.003 | 209021 | TESE | 26.250 |
| 209002 | CYDA | 37.500 | 209005 | TARA | 2.667 | 209021 | XAST | 0.125 |
| 209002 | EQFE | 0.090 | 209005 | TESE | 2.067 | 209022 | ALCA | 14.250 |
| 209002 | GNCH | 0.001 | 209011 | ALCA | 0.001 | 209022 | BASA | 1.250 |
| 209002 | ISAC | 0.001 | 209011 | AMAC | 0.001 | 209022 | BROMUS | 5.005 |
| 209002 | MELIL | 0.275 | 209011 | BASA | 0.001 | 209022 | BROMUS | 0.250 |
| 209002 | MUAS | 0.001 | 209011 | BASL | 0.001 | 209022 | BROMUS | 24.000 |
| 209002 | POMO | 0.025 | 209011 | BOBA | 0.200 | 209022 | COCA | 0.125 |
| 209002 | PRGL | 10.500 | 209011 | BROMUS | 0.001 | 209022 | CYDA | 2.025 |
| 209002 | SAEX | 2.875 | 209011 | CYDA | 32.500 | 209022 | ISAC | 0.750 |
| 209002 | SCPU | 0.001 | 209011 | EQFE | 0.001 | 209022 | OEHO | 0.025 |
| 209002 | TARA | 1.375 | 209011 | HECU | 0.001 | 209022 | PRGL | 0.025 |
| 209002 | TESE | 0.150 | 209011 | PACA | 0.001 | 209022 | SOAS | 0.001 |
| 209002 | XAST | 0.070 | 209011 | PRGL | 2.500 | 209022 | TARA | 0.750 |
| 209003 | ALCA | 9.000 | 209011 | SCPU | 0.001 | 209022 | TESE | 15.000 |
| 209003 | ASSP | 0.001 | 209011 | TARA | 0.150 | 209028 | ALCA | 3.500 |
| 209003 | BASA | 6.500 | 209011 | TESE | 1.000 | 209028 | ARLU | 0.033 |
| 209003 | BOBA | 0.275 | 209012 | ALCA | 0.003 | 209028 | BASA | 0.001 |
| 209003 | BROMUS | 0.010 | 209012 | ARGL | 0.001 | 209028 | BASL | 0.367 |
| 209003 | CYDA | 3.000 | 209012 | BASA | 0.001 | 209028 | BROMUS | 0.033 |
| 209003 | TARA | 2.400 | 209012 | BEJU | 0.001 | 209028 | BROMUS | 3.333 |
| 209003 | TESE | 1.750 | 209012 | BOBA | 0.001 | 209028 | COCA | 0.433 |
| 209004 | ALCA | 0.500 | 209012 | BROMUS | 0.001 | 209028 | CYDA | 33.333 |
| 209004 | ASSP | 0.500 | 209012 | CYDA | 0.083 | 209028 | EQFE | 0.033 |
| 209004 | BASA | 0.767 | 209012 | ISAC | 0.625 | 209028 | MELIL | 0.033 |
| 209004 | BOBA | 0.073 | 209012 | PRGL | 0.001 | 209028 | OEHO | 0.033 |
| 209004 | BROMUS | 0.001 | 209012 | SPCO | 0.020 | 209028 | PRGL | 0.667 |
| 209004 | CYDA | 8.667 | 209012 | SPCR | 0.013 | 209028 | SARA | 0.033 |
| 209004 | DYPE | 0.001 | 209012 | SPFL | 0.033 | 209028 | SPCR | 0.001 |
| 209004 | GUTIERRZ | 0.267 | 209012 | TARA | 0.253 | 209028 | TARA | 0.670 |
| 209004 | ISAC | 0.003 | 209012 | TESE | 2.450 | 209028 | TESE | 2.337 |
| 209004 | OPUNTIA | 0.001 | 209013 | BOBA | 0.010 | 209030 | ALCA | 0.010 |
| 209004 | PAIN | 0.003 | 209013 | CYDA | 10.267 | 209030 | ASSP | 0.001 |
| 209004 | POGR | 0.017 | 209013 | ISAC | 0.007 | 209030 | BASA | 1.333 |
| 209004 | PRGL | 1.233 | 209013 | PRGL | 1.000 | 209030 | BASL | 0.001 |
| 209004 | SPCR | 0.017 | 209013 | SPFL | 0.067 | 209030 | BROMUS | 0.001 |
| 209004 | TARA | 1.000 | 209013 | TARA | 33.333 | 209030 | BROMUS | 11.667 |
| 209005 | ALCA | 5.333 | 209013 | TESE | 1.333 | 209030 | COCA | 0.001 |
| 209005 | BASA | 3.333 | 209021 | ALCA | 16.250 | 209030 | CYDA | 26.667 |
| 209005 | BEJU | 0.001 | 209021 | ARGL | 0.020 | 209030 | ISAC | 0.001 |

| | | | | | | | | |
|--------|----------|--------|--------|----------|--------|--------|----------|--------|
| 209030 | OPUNTIA | 0.001 | 209039 | ALCA | 3.667 | 209054 | CAAQ | 16.667 |
| 209030 | TARA | 20.000 | 209039 | BROMUS | 6.667 | 209054 | COCA | 0.003 |
| 209030 | TESE | 16.667 | 209039 | CYDA | 1.000 | 209054 | CYDA | 31.670 |
| 209031 | ALCA | 0.270 | 209039 | ISAC | 0.001 | 209054 | EQFE | 16.667 |
| 209031 | ANGL | 0.133 | 209039 | SPFL | 0.001 | 209054 | GNCH | 0.003 |
| 209031 | ASSP | 0.003 | 209039 | TARA | 60.000 | 209054 | HOJU | 0.003 |
| 209031 | BAEM | 0.067 | 209039 | TESE | 4.333 | 209054 | JUTO | 0.167 |
| 209031 | BASL | 0.167 | 209046 | AGSE | 0.250 | 209054 | MELIL | 0.001 |
| 209031 | COCA | 0.003 | 209046 | ALCA | 3.025 | 209054 | MUAS | 0.001 |
| 209031 | CYDA | 6.000 | 209046 | ASSP | 0.250 | 209054 | OEHO | 0.167 |
| 209031 | DAWR | 0.003 | 209046 | ASSU | 0.250 | 209054 | PHAU | 0.333 |
| 209031 | EQFE | 75.000 | 209046 | BAEM | 0.001 | 209054 | POMO | 0.001 |
| 209031 | HECU | 0.003 | 209046 | BASA | 6.375 | 209054 | SOLIDAGO | 3.567 |
| 209031 | JUBA | 0.667 | 209046 | BASL | 0.001 | 209054 | SPCR | 0.003 |
| 209031 | JUTO | 0.003 | 209046 | BROMUS | 0.003 | 209054 | TESE | 0.333 |
| 209031 | MELIL | 0.003 | 209046 | BROMUS | 0.003 | 209054 | XAST | 0.833 |
| 209031 | SOAS | 0.001 | 209046 | COCA | 0.125 | 209055 | ALCA | 3.500 |
| 209031 | SOLIDAGO | 0.333 | 209046 | CYDA | 16.500 | 209055 | BASA | 7.500 |
| 209031 | TARA | 0.007 | 209046 | ELEOCH | 0.003 | 209055 | CYDA | 0.100 |
| 209031 | TESE | 0.170 | 209046 | EQFE | 3.750 | 209055 | TARA | 9.000 |
| 209031 | XAST | 0.003 | 209046 | GNCH | 0.003 | 209055 | TESE | 1.000 |
| 209034 | ALCA | 5.333 | 209046 | HOJU | 0.250 | 209056 | ABEL | 0.001 |
| 209034 | BROMUS | 1.667 | 209046 | IMBR | 0.250 | 209056 | ACGR | 1.333 |
| 209034 | CYDA | 41.667 | 209046 | JUBA | 0.003 | 209056 | ALCA | 0.333 |
| 209034 | EQFE | 1.333 | 209046 | JUTO | 0.001 | 209056 | ARGL | 0.033 |
| 209034 | TARA | 28.333 | 209046 | LACTUCA | 0.003 | 209056 | BASA | 1.667 |
| 209034 | TESE | 3.667 | 209046 | MELIL | 0.500 | 209056 | BEJU | 3.000 |
| 209035 | ALCA | 0.505 | 209046 | PLMA | 0.100 | 209056 | BROMUS | 0.003 |
| 209035 | CYDA | 45.000 | 209046 | POMO | 0.003 | 209056 | CYDA | 1.667 |
| 209035 | ECCR | 0.001 | 209046 | PRGL | 0.125 | 209056 | ISAC | 0.001 |
| 209035 | EQFE | 2.750 | 209046 | SCPU | 0.075 | 209056 | OEPA | 0.001 |
| 209035 | MELIL | 0.250 | 209046 | SOLIDAGO | 0.725 | 209056 | SPCO | 0.033 |
| 209035 | PHAU | 0.050 | 209046 | SPCR | 0.003 | 209056 | SPCR | 0.500 |
| 209035 | SOLIDAGO | 0.250 | 209046 | TARA | 30.000 | 209056 | SPFL | 0.003 |
| 209035 | TARA | 0.250 | 209046 | TESE | 2.250 | 209056 | SPFL | 0.001 |
| 209035 | TESE | 3.500 | 209047 | ALCA | 4.500 | 209056 | STPA | 0.001 |
| 209038 | ACGR | 0.001 | 209047 | BASA | 0.050 | 209056 | TARA | 2.333 |
| 209038 | AGSE | 0.003 | 209047 | BROMUS | 0.003 | 209056 | TESE | 1.333 |
| 209038 | ALCA | 2.255 | 209047 | BROMUS | 0.003 | 209063 | ALCA | 30.000 |
| 209038 | ASSU | 0.025 | 209047 | CYDA | 2.503 | 209063 | BAEM | 0.001 |
| 209038 | BASL | 0.750 | 209047 | DIBR | 0.003 | 209063 | BASA | 0.001 |
| 209038 | BROMUS | 0.003 | 209047 | SPCO | 0.125 | 209063 | BASL | 17.625 |
| 209038 | CYDA | 5.750 | 209047 | SPFL | 0.050 | 209063 | CYDA | 32.750 |
| 209038 | ECCR | 0.003 | 209047 | TARA | 0.050 | 209063 | EQFE | 20.500 |
| 209038 | GNCH | 0.003 | 209047 | TESE | 8.000 | 209063 | TARA | 3.275 |
| 209038 | MELIL | 0.028 | 209054 | AGSE | 0.003 | 209063 | TESE | 0.750 |
| 209038 | PLMA | 0.001 | 209054 | AGST | 0.003 | 209064 | ALCA | 6.667 |
| 209038 | SAGO | 10.000 | 209054 | ALCA | 4.000 | 209064 | BASA | 0.667 |
| 209038 | SOLIDAGO | 0.003 | 209054 | ANGL | 0.667 | 209064 | BROMUS | 0.003 |
| 209038 | SPCR | 0.025 | 209054 | ASSU | 0.003 | 209064 | BROMUS | 0.167 |
| 209038 | TESE | 2.525 | 209054 | BASL | 1.667 | 209064 | CYDA | 17.333 |
| 209039 | ABEL | 0.333 | 209054 | BROMUS | 0.003 | 209064 | ERIGERON | 0.333 |



Appendix D

Polygon Foliar Vertical Structure Data Collected During the August / September 1996 Vegetation Monitoring Trip

Data were collected in each of the nine monitoring sites between Lees Ferry and Diamond Creek on a field trip running from August 27 to September 10 1996. These data also include estimates for the depth of surface organics (duff) in each of the polygons. Data are in columns as follows:

POLYGON: A six-digit number of the form "MMMPPP" where "MMM" is a three-digit site identifier and "PPP" is a three-digit polygon identifier. For example, the polygon listed as 071016 contains data on polygon 16 from the sampling site at 71.4 L.

DUFF: An estimate of the depth of surface organic material in each polygon. Estimates listed are means of up to eight measurements.

0.0 - 0.3: An estimate of the density of foliage between 0 and 30 cm from the ground surface. Estimates are the means of up to eight measurement of the number of contacts with live leaves and / or branches in that increment.

0.3 - 1.0: As above, for the increment between 30 cm and 1 meter.

1.0 - 2.0: As above, for the increment between 1 and 2 meters.

2.0 - 4.0: As above, for the increment between 2 and 4 meters.

4 + As above, for all contacts above 4 meters.

Polygon Vertical Structure Data
Site: 43 L

August 1997 Sampling Trip

| Polygon | Duff | 0 - 0.3 m | 0.3 - 1.0 m | 1.0 - 2.0 m | 2.0 - 4.0 m | > 4.0 m |
|---------|-------|-----------|-------------|-------------|-------------|---------|
| 043002 | 0.775 | 1.25 | 3.00 | 3.75 | 1.88 | 0.00 |
| 043003 | 0.113 | 1.88 | 0.63 | 0.50 | 0.25 | 0.00 |
| 043007 | 0.325 | 6.25 | 1.25 | 0.50 | 0.25 | 0.00 |
| 043008 | 0.175 | 0.38 | 0.00 | 0.00 | 0.00 | 0.00 |
| 043010 | 0.150 | 3.17 | 3.33 | 3.83 | 1.67 | 0.00 |
| 043011 | 0.075 | 1.25 | 2.00 | 6.25 | 6.13 | 0.00 |
| 043012 | 1.763 | 0.25 | 1.00 | 3.38 | 8.63 | 0.63 |
| 043014 | 0.025 | 0.00 | 0.00 | 0.13 | 0.00 | 0.00 |
| 043015 | 0.025 | 0.88 | 0.75 | 1.50 | 0.38 | 0.00 |
| 043016 | 0.075 | 1.25 | 1.25 | 2.50 | 0.00 | 0.00 |
| 043017 | 0.025 | 0.00 | 0.25 | 0.25 | 0.00 | 0.00 |
| 043018 | 0.225 | 2.38 | 2.63 | 1.00 | 0.00 | 0.00 |
| 043019 | 0.113 | 6.63 | 3.50 | 1.00 | 0.00 | 0.00 |
| 043021 | 0.000 | 0.17 | 1.33 | 0.00 | 0.00 | 0.00 |
| 043022 | 0.000 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 |
| 043023 | 0.050 | 2.13 | 0.00 | 0.00 | 0.00 | 0.00 |
| 043024 | 0.025 | 0.75 | 1.88 | 0.00 | 0.00 | 0.00 |
| 043025 | 0.413 | 0.00 | 1.75 | 4.00 | 4.00 | 2.00 |
| 043026 | 0.100 | 0.88 | 0.75 | 0.38 | 0.13 | 0.00 |
| 043027 | 0.000 | 0.25 | 0.50 | 0.00 | 0.00 | 0.00 |
| 043028 | 0.125 | 1.63 | 2.88 | 2.75 | 3.63 | 0.00 |
| 043031 | 0.100 | 2.38 | 0.00 | 0.00 | 0.00 | 0.00 |
| 043032 | 0.063 | 1.13 | 0.00 | 0.00 | 0.00 | 0.00 |
| 043033 | 0.013 | 1.63 | 0.75 | 0.00 | 0.00 | 0.00 |
| 043036 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 043037 | 0.000 | 0.00 | 0.20 | 0.00 | 0.00 | 0.00 |
| 043038 | 0.038 | 0.13 | 0.75 | 0.88 | 0.00 | 0.00 |
| 043041 | 0.067 | 0.83 | 0.50 | 0.83 | 0.00 | 0.00 |
| 043042 | 0.000 | 0.00 | 0.38 | 0.00 | 0.00 | 0.00 |
| 043043 | 0.013 | 0.75 | 1.00 | 0.38 | 0.00 | 0.00 |
| 043048 | 0.020 | 1.60 | 4.00 | 2.00 | 0.00 | 0.00 |
| 043049 | 0.000 | 2.00 | 4.60 | 1.40 | 0.00 | 0.00 |
| 043050 | 0.088 | 1.13 | 0.00 | 0.00 | 0.00 | 0.00 |
| 043057 | 0.000 | 0.29 | 0.00 | 0.00 | 0.00 | 0.00 |
| 043059 | 0.000 | 2.60 | 5.40 | 2.80 | 0.00 | 0.00 |
| 043060 | 2.700 | 0.38 | 0.63 | 2.88 | 3.50 | 3.50 |
| 043063 | 0.060 | 4.20 | 4.80 | 0.00 | 0.00 | 0.00 |

Polygon Vertical Structure Data
Site: 51 L

August 1997 Sampling Trip

| Polygon | Duff | 0 - 0.3 m | 0.3 - 1.0 m | 1.0 - 2.0 m | 2.0 - 4.0 m | > 4.0 m |
|---------|-------|-----------|-------------|-------------|-------------|---------|
| 051001 | 0.138 | 6.38 | 0.88 | 0.00 | 0.00 | 0.00 |
| 051002 | 0.225 | 1.50 | 2.88 | 2.13 | 0.75 | 0.00 |
| 051009 | 4.750 | 0.50 | 1.13 | 0.00 | 1.25 | 1.63 |
| 051012 | 0.263 | 6.00 | 8.00 | 0.50 | 4.25 | 1.88 |
| 051013 | 3.113 | 0.75 | 1.88 | 1.63 | 0.00 | 0.25 |
| 051018 | 0.000 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 |
| 051019 | 0.050 | 1.63 | 2.00 | 1.75 | 0.00 | 0.00 |
| 051020 | 0.033 | 1.17 | 1.17 | 0.50 | 0.00 | 0.00 |
| 051021 | 0.025 | 2.25 | 1.75 | 0.38 | 0.00 | 0.00 |
| 051022 | 0.063 | 4.00 | 1.25 | 0.00 | 0.00 | 0.00 |
| 051023 | 0.138 | 1.38 | 4.88 | 4.00 | 0.25 | 0.00 |
| 051024 | 0.063 | 1.63 | 3.75 | 0.00 | 0.00 | 0.00 |
| 051025 | 0.000 | 1.25 | 0.38 | 0.25 | 0.00 | 0.00 |
| 051029 | 0.175 | 1.38 | 0.25 | 0.63 | 0.00 | 0.00 |
| 051030 | 0.000 | 1.88 | 1.63 | 0.25 | 0.00 | 0.00 |
| 051031 | 0.013 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 051032 | 0.063 | 0.38 | 1.75 | 0.00 | 0.00 | 0.00 |
| 051033 | 0.013 | 0.00 | 0.00 | 1.00 | 0.38 | 0.00 |
| 051034 | 0.025 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 051035 | 0.050 | 1.13 | 5.63 | 1.00 | 0.00 | 0.00 |
| 051036 | 0.063 | 0.00 | 2.50 | 1.75 | 0.63 | 0.00 |
| 051040 | 0.025 | 0.00 | 1.63 | 1.50 | 0.00 | 0.00 |
| 051041 | 0.013 | 0.00 | 0.63 | 1.88 | 0.00 | 0.00 |
| 051042 | 0.075 | 0.00 | 0.38 | 1.00 | 0.13 | 0.00 |
| 051043 | 0.100 | 0.67 | 2.00 | 3.67 | 4.50 | 0.17 |
| 051044 | 0.700 | 0.13 | 1.75 | 5.25 | 4.13 | 2.25 |
| 051045 | 0.288 | 4.75 | 2.75 | 1.25 | 1.00 | 0.00 |
| 051046 | 0.075 | 2.00 | 0.88 | 0.13 | 0.75 | 0.00 |
| 051050 | 1.363 | 0.50 | 0.00 | 3.13 | 2.88 | 1.63 |
| 051055 | 0.050 | 2.88 | 1.50 | 0.00 | 0.00 | 0.00 |
| 051069 | 0.588 | 1.00 | 1.00 | 1.25 | 4.25 | 0.13 |
| 051070 | 0.075 | 1.88 | 2.13 | 0.63 | 1.88 | 0.38 |
| 051071 | 0.163 | 2.50 | 1.50 | 0.38 | 0.00 | 0.00 |
| 051091 | 0.300 | 0.00 | 0.25 | 7.25 | 3.00 | 0.00 |
| 051092 | 0.225 | 6.50 | 1.25 | 0.75 | 0.00 | 0.00 |

Polygon Vertical Structure Data
Site: 55 R

August 1997 Sampling Trip

| Polygon | Duff | 0 - 0.3 m | 0.3 - 1.0 m | 1.0 - 2.0 m | 2.0 - 4.0 m | > 4.0 m |
|---------|-------|-----------|-------------|-------------|-------------|---------|
| 055001 | 1.788 | 2.00 | 2.75 | 2.75 | 1.88 | 0.00 |
| 055008 | 0.025 | 0.38 | 0.00 | 0.00 | 0.00 | 0.00 |
| 055009 | 0.025 | 2.13 | 0.63 | 0.00 | 0.00 | 0.00 |
| 055010 | 0.031 | 3.00 | 0.50 | 0.00 | 0.00 | 0.00 |
| 055011 | 0.013 | 1.25 | 3.38 | 3.63 | 0.25 | 0.00 |
| 055012 | 0.231 | 2.44 | 2.19 | 0.00 | 0.00 | 0.00 |
| 055015 | 0.013 | 2.25 | 0.13 | 0.00 | 0.00 | 0.00 |
| 055016 | 0.000 | 5.13 | 3.25 | 0.50 | 0.00 | 0.00 |
| 055017 | 0.263 | 4.13 | 4.13 | 1.50 | 0.00 | 0.00 |
| 055018 | 0.306 | 0.25 | 1.63 | 4.25 | 3.75 | 0.00 |
| 055019 | 0.425 | 6.75 | 1.25 | 1.00 | 1.25 | 0.00 |
| 055020 | 0.025 | 0.38 | 0.50 | 0.00 | 0.00 | 0.00 |
| 055021 | 0.150 | 1.25 | 2.25 | 6.50 | 0.25 | 0.00 |
| 055023 | 0.138 | 0.63 | 3.00 | 6.63 | 0.50 | 0.00 |
| 055024 | 0.038 | 2.13 | 6.25 | 3.63 | 0.00 | 0.00 |
| 055025 | 0.038 | 2.00 | 1.63 | 0.38 | 0.00 | 0.00 |
| 055026 | 0.063 | 3.25 | 3.00 | 1.75 | 0.00 | 0.00 |
| 055027 | 0.063 | 2.25 | 7.50 | 8.63 | 1.13 | 0.00 |
| 055028 | 2.363 | 0.63 | 0.75 | 0.75 | 1.25 | 0.00 |
| 055029 | 0.563 | 0.38 | 2.25 | 6.38 | 5.13 | 1.13 |
| 055034 | 0.013 | 2.38 | 2.38 | 0.00 | 0.00 | 0.00 |
| 055037 | 0.000 | 0.63 | 0.38 | 0.00 | 0.00 | 0.00 |
| 055038 | 0.006 | 1.31 | 2.19 | 0.75 | 0.00 | 0.00 |
| 055039 | 0.013 | 0.13 | 0.00 | 1.00 | 0.00 | 0.00 |
| 055040 | 0.008 | 1.50 | 4.08 | 0.71 | 0.00 | 0.00 |
| 055045 | 0.363 | 5.25 | 6.50 | 2.63 | 0.38 | 0.00 |
| 055047 | 0.113 | 1.38 | 4.50 | 1.13 | 0.00 | 0.00 |
| 055048 | 1.388 | 1.25 | 1.50 | 3.88 | 2.50 | 0.63 |
| 055049 | 0.363 | 1.75 | 2.88 | 4.50 | 0.25 | 0.00 |
| 055054 | 0.025 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| 055055 | 0.038 | 2.13 | 6.00 | 3.88 | 0.13 | 0.00 |
| 055056 | 0.588 | 1.13 | 2.25 | 2.63 | 1.50 | 0.00 |
| 055070 | 0.038 | 2.38 | 2.38 | 7.25 | 1.88 | 0.00 |

Polygon Vertical Structure Data
Site: 68 R

August 1997 Sampling Trip

| Polygon | Duff | 0 - 0.3 m | 0.3 - 1.0 m | 1.0 - 2.0 m | 2.0 - 4.0 m | > 4.0 m |
|---------|-------|-----------|-------------|-------------|-------------|---------|
| 068001 | 0.075 | 1.38 | 1.13 | 0.63 | 0.00 | 0.00 |
| 068002 | 1.325 | 0.38 | 0.75 | 1.75 | 0.00 | 0.00 |
| 068003 | 0.063 | 0.50 | 1.50 | 2.13 | 3.75 | 0.88 |
| 068004 | 2.438 | 0.00 | 0.00 | 1.00 | 4.50 | 1.25 |
| 068017 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 068019 | 0.013 | 3.75 | 4.75 | 0.25 | 0.00 | 0.00 |
| 068020 | 0.213 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 |
| 068021 | 4.388 | 0.50 | 1.50 | 1.38 | 0.00 | 0.00 |
| 068022 | 0.975 | 0.00 | 2.38 | 3.63 | 0.00 | 0.00 |
| 068023 | 0.225 | 0.00 | 1.13 | 2.25 | 0.00 | 0.00 |
| 068024 | 0.100 | 0.00 | 0.25 | 0.00 | 0.00 | 0.00 |
| 068031 | 0.050 | 2.13 | 4.25 | 1.25 | 0.00 | 0.00 |
| 068032 | 0.038 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 |
| 068033 | 0.338 | 0.25 | 3.88 | 2.50 | 0.00 | 0.00 |
| 068034 | 0.438 | 0.25 | 0.13 | 4.13 | 0.63 | 0.00 |
| 068035 | 0.175 | 0.13 | 1.13 | 1.00 | 0.50 | 0.00 |
| 068036 | 0.025 | 0.13 | 0.50 | 0.00 | 0.00 | 0.00 |
| 068038 | 0.125 | 1.38 | 3.13 | 0.75 | 0.00 | 0.00 |
| 068039 | 0.013 | 0.75 | 3.13 | 0.50 | 0.00 | 0.00 |
| 068040 | 0.013 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 |
| 068041 | 0.138 | 2.38 | 4.38 | 2.75 | 0.00 | 0.00 |
| 068042 | 2.613 | 1.13 | 0.75 | 0.00 | 0.00 | 0.00 |
| 068043 | 0.013 | 0.63 | 0.00 | 0.00 | 0.00 | 0.00 |
| 068046 | 0.275 | 1.88 | 3.00 | 2.50 | 0.00 | 0.00 |
| 068047 | 0.175 | 0.50 | 2.00 | 1.13 | 1.00 | 2.63 |
| 068048 | 0.075 | 1.75 | 3.63 | 5.88 | 0.75 | 0.00 |

Polygon Vertical Structure Data
Site: 71 L

August 1997 Sampling Trip

| Polygon | Duff | 0 - 0.3 m | 0.3 - 1.0 m | 1.0 - 2.0 m | 2.0 - 4.0 m | > 4.0 m |
|---------|--------|-----------|-------------|-------------|-------------|---------|
| 071001 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 071002 | 0.05 | 0.63 | 1.25 | 1.13 | 0.00 | 0.00 |
| 071003 | 0.125 | 0.00 | 0.50 | 1.63 | 0.00 | 0.00 |
| 071007 | 0 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 |
| 071008 | 0.05 | 0.75 | 1.38 | 0.25 | 0.00 | 0.00 |
| 071009 | 2.6125 | 1.50 | 3.25 | 3.50 | 0.38 | 0.00 |
| 071010 | 0.15 | 0.25 | 1.00 | 2.13 | 0.38 | 0.00 |
| 071012 | 0.2 | 0.63 | 2.88 | 1.63 | 0.00 | 0.00 |
| 071014 | 0.45 | 0.13 | 0.63 | 1.25 | 0.25 | 0.00 |
| 071015 | 0.1 | 0.00 | 0.38 | 1.00 | 0.00 | 0.00 |
| 071019 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 071020 | 0.025 | 0.38 | 0.75 | 0.00 | 0.00 | 0.00 |
| 071021 | 0.05 | 0.25 | 2.00 | 3.00 | 5.63 | 3.13 |
| 071022 | 5.45 | 0.00 | 0.63 | 1.13 | 3.88 | 12.38 |
| 071026 | 0.0125 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 |
| 071027 | 0.3 | 0.50 | 1.38 | 1.13 | 1.88 | 2.25 |
| 071028 | 1.375 | 1.75 | 2.88 | 5.25 | 0.00 | 0.00 |
| 071030 | 0.2125 | 3.25 | 1.00 | 0.38 | 0.00 | 0.00 |
| 071032 | 1.9 | 0.75 | 1.13 | 1.25 | 0.00 | 0.00 |
| 071033 | 5.1875 | 0.50 | 4.50 | 8.38 | 1.00 | 0.00 |
| 071035 | 6.1 | 0.75 | 3.00 | 5.00 | 0.25 | 0.00 |
| 071036 | 4.25 | 0.00 | 0.00 | 0.50 | 2.13 | 7.00 |
| 071037 | 2.9625 | 0.88 | 0.88 | 2.25 | 4.75 | 1.13 |
| 071038 | 3.2875 | 0.13 | 3.13 | 6.63 | 5.63 | 0.00 |
| 071039 | 1.1375 | 0.13 | 2.75 | 3.63 | 3.25 | 1.63 |
| 071040 | 0.2625 | 0.25 | 0.75 | 1.00 | 0.25 | 0.00 |
| 071041 | 0.4125 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 |
| 071042 | 0.3125 | 0.13 | 1.13 | 3.50 | 0.38 | 0.00 |
| 071043 | 0.5 | 1.13 | 1.38 | 1.63 | 0.25 | 0.00 |
| 071044 | 1.0375 | 0.00 | 1.13 | 3.25 | 2.13 | 0.38 |
| 071048 | 0.6875 | 1.00 | 1.63 | 2.25 | 0.63 | 0.00 |
| 071049 | 2.5 | 0.00 | 0.00 | 0.00 | 3.88 | 3.50 |

Polygon Vertical Structure Data
Site: 94 L

August 1997 Sampling Trip

| Polygon | Duff | 0 - 0.3 m | 0.3 - 1.0 m | 1.0 - 2.0 m | 2.0 - 4.0 m | > 4.0 m |
|---------|-------|-----------|-------------|-------------|-------------|---------|
| 094002 | 0.013 | 0.00 | 0.88 | 0.75 | 0.00 | 0.00 |
| 094003 | 0.038 | 0.88 | 4.13 | 4.75 | 0.88 | 0.00 |
| 094004 | 0.138 | 1.00 | 3.50 | 4.88 | 3.75 | 0.00 |
| 094005 | 0.000 | 0.00 | 0.00 | 0.13 | 0.00 | 0.00 |
| 094006 | 0.513 | 0.00 | 1.00 | 2.63 | 4.75 | 0.63 |
| 094009 | 0.050 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 094010 | 0.013 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 094011 | 1.138 | 0.00 | 0.50 | 0.88 | 6.63 | 1.63 |
| 094012 | 0.075 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 |
| 094018 | 1.150 | 0.00 | 0.50 | 1.25 | 4.50 | 1.50 |
| 094024 | 0.150 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 094025 | 0.175 | 1.00 | 1.13 | 3.75 | 1.75 | 0.00 |
| 094033 | 0.625 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 094034 | 3.788 | 0.38 | 0.38 | 0.00 | 0.00 | 0.00 |
| 094035 | 0.000 | 0.00 | 0.25 | 0.50 | 0.00 | 0.00 |
| 094037 | 0.263 | 0.50 | 0.50 | 0.00 | 0.00 | 0.00 |
| 094039 | 0.125 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 094045 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 094050 | 0.638 | 0.88 | 0.50 | 0.25 | 0.13 | 0.00 |
| 094051 | 0.013 | 0.00 | 0.00 | 0.25 | 0.00 | 0.00 |
| 094053 | 0.075 | 0.13 | 1.13 | 6.50 | 5.13 | 0.00 |
| 094054 | 0.463 | 0.13 | 0.13 | 5.50 | 2.63 | 0.00 |

Polygon Vertical Structure Data
Site: 123 L

August 1997 Sampling Trip

| Polygon | Duff | 0 - 0.3 m | 0.3 - 1.0 m | 1.0 - 2.0 m | 2.0 - 4.0 m | > 4.0 m |
|---------|-------|-----------|-------------|-------------|-------------|---------|
| 123001 | 0.900 | 2.50 | 2.88 | 1.00 | 0.13 | 0.00 |
| 123002 | 0.075 | 0.63 | 2.88 | 1.25 | 0.00 | 0.00 |
| 123008 | 0.075 | 1.40 | 4.25 | 3.25 | 0.25 | 0.00 |
| 123009 | 0.038 | 0.00 | 1.75 | 0.00 | 0.00 | 0.00 |
| 123012 | 0.063 | 1.00 | 0.25 | 0.00 | 0.00 | 0.00 |
| 123013 | 0.025 | 0.88 | 2.13 | 2.63 | 0.00 | 0.00 |
| 123014 | 4.113 | 0.88 | 2.13 | 5.00 | 3.00 | 0.00 |
| 123016 | 0.125 | 0.25 | 0.38 | 0.00 | 0.00 | 0.00 |
| 123017 | 0.338 | 3.00 | 0.88 | 0.25 | 2.13 | 0.00 |
| 123019 | 0.013 | 0.38 | 0.25 | 0.00 | 0.00 | 0.00 |
| 123024 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 123025 | 0.075 | 1.75 | 0.50 | 1.13 | 0.38 | 0.00 |
| 123026 | 0.875 | 0.00 | 0.25 | 5.75 | 2.88 | 0.00 |
| 123027 | 0.113 | 0.63 | 6.13 | 6.00 | 0.50 | 0.00 |
| 123033 | 0.013 | 0.00 | 0.88 | 0.00 | 0.00 | 0.00 |
| 123034 | 0.013 | 0.50 | 2.00 | 2.00 | 0.88 | 0.00 |
| 123035 | 0.025 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 |
| 123039 | 0.050 | 0.50 | 2.75 | 4.63 | 2.88 | 0.00 |
| 123040 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 123041 | 0.025 | 0.63 | 1.50 | 0.63 | 0.00 | 0.00 |
| 123042 | 0.050 | 0.00 | 1.50 | 1.63 | 0.00 | 0.00 |
| 123044 | 0.038 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 123049 | 0.075 | 0.63 | 2.00 | 1.88 | 0.00 | 0.00 |
| 123050 | 0.050 | 0.00 | 0.38 | 0.00 | 0.00 | 0.00 |
| 123051 | 0.013 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 123052 | 0.000 | 0.00 | 0.25 | 0.88 | 0.00 | 0.00 |
| 123053 | 0.800 | 0.13 | 0.38 | 0.00 | 0.00 | 0.00 |
| 123057 | 0.013 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 123058 | 0.000 | 0.50 | 0.00 | 0.00 | 0.00 | 0.00 |
| 123061 | 0.000 | 1.00 | 2.25 | 0.00 | 0.00 | 0.00 |
| 123062 | 0.038 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 123063 | 0.063 | 0.25 | 0.63 | 0.00 | 0.00 | 0.00 |
| 123064 | 0.038 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Polygon Vertical Structure Data
Site: 194 L

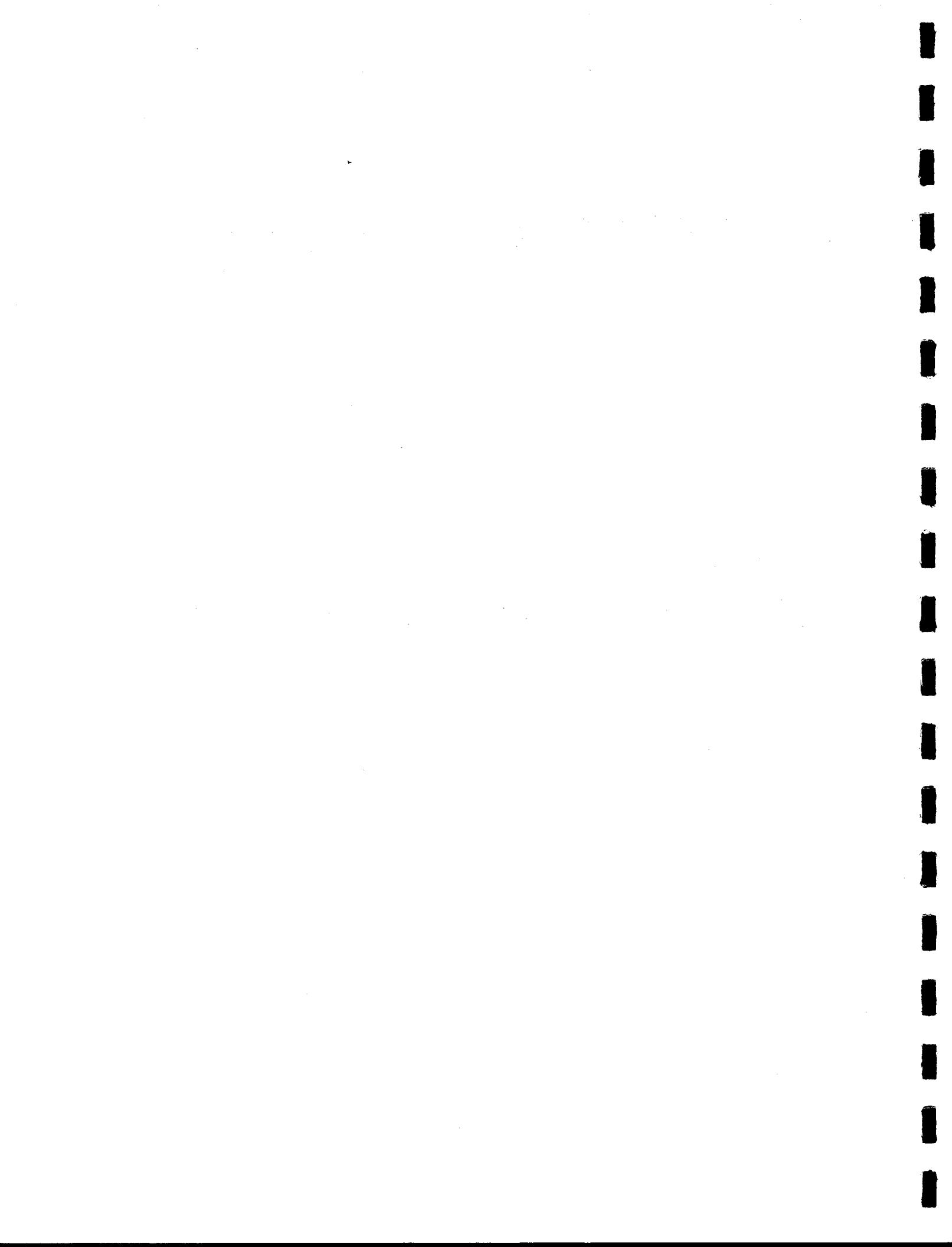
August 1997 Sampling Trip

| Polygon | Duff | 0 - 0.3 m | 0.3 - 1.0 m | 1.0 - 2.0 m | 2.0 - 4.0 m | > 4.0 m |
|---------|-------|-----------|-------------|-------------|-------------|---------|
| 194003 | 0.175 | 4.00 | 4.88 | 3.88 | 1.25 | 0.00 |
| 194004 | 1.788 | 4.25 | 3.88 | 3.38 | 0.88 | 0.00 |
| 194005 | 0.063 | 0.63 | 0.25 | 0.00 | 0.00 | 0.00 |
| 194010 | 0.038 | 1.38 | 1.13 | 0.25 | 0.00 | 0.00 |
| 194011 | 0.013 | 0.50 | 0.00 | 0.00 | 0.00 | 0.00 |
| 194012 | 0.013 | 0.50 | 1.13 | 0.38 | 0.00 | 0.00 |
| 194013 | 0.775 | 1.38 | 2.88 | 1.25 | 2.88 | 0.00 |
| 194014 | 0.075 | 1.63 | 4.38 | 12.38 | 3.50 | 0.38 |
| 194015 | 0.313 | 3.38 | 2.63 | 3.25 | 2.63 | 0.00 |
| 194016 | 0.350 | 0.00 | 0.50 | 3.38 | 2.38 | 0.00 |
| 194018 | 0.038 | 0.88 | 1.38 | 2.88 | 0.00 | 0.00 |
| 194019 | 0.025 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 194020 | 0.075 | 0.50 | 4.13 | 5.00 | 0.00 | 0.00 |
| 194021 | 0.088 | 1.13 | 3.00 | 4.75 | 1.13 | 0.00 |
| 194022 | 0.063 | 1.38 | 1.88 | 1.75 | 0.13 | 0.00 |
| 194023 | 0.075 | 1.75 | 3.13 | 1.38 | 0.00 | 0.00 |
| 194024 | 0.188 | 2.13 | 1.25 | 2.63 | 0.25 | 0.00 |
| 194025 | 0.200 | 0.00 | 0.75 | 2.25 | 2.63 | 0.38 |
| 194028 | 0.313 | 4.25 | 1.63 | 0.88 | 7.00 | 3.38 |
| 194029 | 0.075 | 0.75 | 0.25 | 1.00 | 0.00 | 0.00 |
| 194030 | 0.250 | 0.00 | 0.00 | 3.75 | 6.75 | 2.13 |
| 194031 | 0.038 | 0.25 | 0.38 | 0.75 | 0.00 | 0.00 |
| 194032 | 0.100 | 0.00 | 0.75 | 4.00 | 0.13 | 0.00 |
| 194033 | 0.875 | 0.13 | 0.50 | 2.75 | 6.63 | 0.63 |
| 194040 | 0.163 | 4.50 | 3.00 | 2.88 | 0.00 | 0.00 |
| 194042 | 0.063 | 3.13 | 0.00 | 0.00 | 0.00 | 0.00 |
| 194043 | 0.200 | 1.13 | 0.25 | 1.00 | 1.00 | 0.00 |
| 194050 | 1.150 | 0.25 | 0.13 | 0.50 | 7.13 | 11.38 |
| 194053 | 2.163 | 0.00 | 0.00 | 0.13 | 2.25 | 15.00 |
| 194060 | 0.375 | 0.50 | 3.13 | 4.38 | 0.13 | 0.00 |
| 194061 | 0.250 | 1.50 | 3.63 | 3.63 | 0.88 | 0.00 |

Polygon Vertical Structure Data
Site: 209 L

August 1997 Sampling Trip

| Polygon | Duff | 0 - 0.3 m | 0.3 - 1.0 m | 1.0 - 2.0 m | 2.0 - 4.0 m | > 4.0 m |
|---------|-------|-----------|-------------|-------------|-------------|---------|
| 209002 | 0.063 | 2.63 | 0.00 | 0.00 | 0.00 | 0.00 |
| 209003 | 0.463 | 1.63 | 1.50 | 0.75 | 0.00 | 0.00 |
| 209004 | 0.688 | 1.00 | 1.25 | 1.00 | 0.00 | 0.00 |
| 209005 | 0.038 | 0.63 | 0.00 | 0.00 | 0.00 | 0.00 |
| 209011 | 0.075 | 1.13 | 0.38 | 0.00 | 0.00 | 0.00 |
| 209012 | 0.025 | 0.25 | 0.50 | 0.00 | 0.00 | 0.00 |
| 209013 | 0.325 | 1.00 | 2.25 | 2.38 | 0.00 | 0.00 |
| 209021 | 0.038 | 2.00 | 4.38 | 0.00 | 0.00 | 0.00 |
| 209022 | 0.150 | 2.38 | 5.50 | 3.63 | 2.75 | 0.00 |
| 209028 | 0.075 | 4.38 | 3.88 | 0.00 | 0.00 | 0.00 |
| 209030 | 0.125 | 7.13 | 2.63 | 2.13 | 0.00 | 0.00 |
| 209031 | 0.725 | 3.38 | 4.00 | 1.63 | 0.00 | 0.00 |
| 209032 | 0.225 | 3.75 | 4.75 | 0.25 | 0.00 | 0.00 |
| 209034 | 0.613 | 4.63 | 6.88 | 4.38 | 7.13 | 3.13 |
| 209035 | 0.075 | 5.38 | 5.00 | 1.38 | 0.00 | 0.00 |
| 209038 | 0.013 | 0.00 | 0.00 | 2.13 | 0.00 | 0.63 |
| 209039 | 0.075 | 0.63 | 0.00 | 0.13 | 10.00 | 3.88 |
| 209046 | 1.938 | 3.00 | 0.25 | 7.00 | 8.75 | 0.00 |
| 209047 | 0.050 | 0.75 | 1.63 | 0.75 | 0.00 | 0.00 |
| 209054 | 0.038 | 3.00 | 2.50 | 0.00 | 0.00 | 0.00 |
| 209055 | 0.025 | 0.13 | 0.63 | 0.50 | 0.00 | 0.00 |
| 209063 | 0.100 | 5.75 | 7.63 | 0.25 | 0.00 | 0.00 |
| 209064 | 0.088 | 2.25 | 4.25 | 2.50 | 0.50 | 0.00 |
| 209065 | 0.100 | 0.50 | 1.25 | 0.00 | 0.00 | 0.00 |
| 209066 | 0.000 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 209067 | 0.638 | 1.00 | 2.25 | 3.13 | 3.38 | 0.00 |
| 209068 | 0.113 | 1.75 | 0.25 | 1.88 | 0.38 | 0.00 |
| 209069 | 0.088 | 2.75 | 1.75 | 1.13 | 0.00 | 0.00 |
| 209071 | 0.075 | 3.88 | 6.63 | 0.88 | 0.00 | 0.00 |



Appendix E

Data From Pre- and Post-Flood Seed Bank Germination Study

Data are from greenhouse germination of soil samples collected during pre- and post-flood trips. Pre-flood soils were collected in February 1996, and post-flood soils were collected in May 1996. Columns of data are as follows:

POLYGON: A six-digit number of the form "MMMPPP" where "MMM" is a three-digit site identifier and "PPP" is a three-digit polygon identifier. For example, the polygon listed as 071016 contains data on polygon 16 from the sampling site at 71.4 L. In cases where a polygon is not named, in either pre- or post-flood data, no germination was recorded in samples from that polygon.

TIMING: An indicator of pre- (= "X") and post- (=Y) flood sampling trips.

SPECIES: An acronym, as per Appendix A of this report, for the species whose percent foliar cover is being estimated for the polygon. Some individuals, noted as "Grass" or by the genus name only, had yet to flower and thus, were unidentifiable at the time of this report's submission.

NUMBER: The number of seedlings, summed across all three samples per polygon, germinated in the greenhouse.

Seed Bank Study: Pre- and Post-Flood Samples

Site: 43.1 L

| Polygon | Timing | Species | Number | 043018 | X | COCA | 11 |
|---------|--------|---------|--------|--------|---|--------|-----|
| 043002 | X | AGSE | 1 | 043018 | X | CEEX | 11 |
| 043002 | X | GNCH | 25 | 043018 | X | CAAQ | 2 |
| 043002 | X | SPOROB | 1 | 043018 | X | GNCH | 2 |
| 043003 | X | BRRU | 2 | 043018 | X | JUAR | 2 |
| 043003 | X | GNCH | 11 | 043018 | X | TYDO | 1 |
| 043003 | X | JUTO | 4 | 043018 | X | MUAS | 1 |
| 043003 | X | SPOROB | 2 | 043019 | X | JUAR | 1 |
| 043007 | X | EQAR | 3 | 043019 | X | JUBA | 2 |
| 043007 | X | JUAR | 17 | 043019 | X | COCA | 1 |
| 043008 | X | GNCH | 2 | 043019 | X | GNCH | 4 |
| 043008 | X | TYDO | 1 | 043019 | X | VEAN | 1 |
| 043008 | X | BRRU | 3 | 043019 | X | VEAM | 2 |
| 043010 | X | VEAN | 3 | 043019 | X | TYDO | 2 |
| 043010 | X | EQAR | 1 | 043019 | X | LEMO | 3 |
| 043010 | X | JUAR | 5 | 043021 | X | TYDO | 1 |
| 043010 | X | GNCH | 5 | 043023 | X | SPOROB | 100 |
| 043010 | X | SOLIDAG | 1 | 043023 | X | PLMA | 28 |
| 043010 | X | JUTO | 11 | 043023 | X | GNCH | 3 |
| 043010 | X | TYDO | 3 | 043023 | X | ERIGER | 2 |
| 043011 | X | JUAR | 1 | 043023 | X | ERCU | 1 |
| 043011 | X | GNCH | 14 | 043023 | X | MUAS | 1 |
| 043011 | X | TYDO | 4 | 043025 | X | GNCH | 6 |
| 043011 | X | NAOF | 1 | 043025 | X | GRASS | 1 |
| 043011 | X | JUTO | 2 | 043026 | X | MUAS | 1 |
| 043012 | X | TYDO | 1 | 043026 | X | COCA | 1 |
| 043015 | X | GNCH | 53 | 043026 | X | SPOROB | 28 |
| 043015 | X | SOAS | 1 | 043026 | X | GRASS | 1 |
| 043015 | X | GRASS | 6 | 043027 | X | CYDA | 1 |
| 043015 | X | PACA | 1 | 043028 | X | BRRU | 2 |
| 043015 | X | SPOROB | 1 | 043032 | X | ERIGER | 1 |
| 043015 | X | ERIGER | 1 | 043032 | X | GNCH | 1 |
| 043015 | X | COCA | 1 | 043032 | X | POMO | 1 |
| 043016 | X | GNCH | 2 | 043032 | X | GRASS | 1 |
| 043016 | X | GRASS | 1 | 043032 | X | SPOROB | 2 |
| 043016 | X | TYDO | 2 | 043032 | X | JUEN | 2 |
| 043016 | X | BRRU | 2 | 043033 | X | BRRU | 1 |
| 043018 | X | GRASS | 2 | 043033 | X | GNCH | 1 |
| 043018 | X | JUTO | 5 | 043033 | X | SPOROB | 1 |

| | | | | | | | |
|--------|---|----------|----|--------|---|------|---|
| 043038 | X | BAEM | 1 | 043012 | Y | JUAR | 1 |
| 043038 | X | GNCH | 1 | 043023 | Y | BRRU | 1 |
| 043038 | X | NAOF | 1 | 043023 | Y | EQFE | 1 |
| 043038 | X | SPOROB | 1 | 043023 | Y | GNCH | 4 |
| 043038 | X | BRRU | 1 | 043023 | Y | JUAR | 2 |
| 043039 | X | SPOROB | 1 | 043026 | Y | BRRU | 8 |
| 043041 | X | COCA | 1 | 043032 | Y | VEAM | 1 |
| 043044 | X | TYDO | 1 | 043032 | Y | GNCH | 5 |
| 043044 | X | BAEM | 1 | 043032 | Y | BRRU | 5 |
| 043044 | X | SPOROB | 1 | 043033 | Y | GNCH | 1 |
| 043048 | X | BAEM | 2 | 043038 | Y | BRRU | 1 |
| 043048 | X | GNCH | 1 | 043091 | Y | BRRI | 7 |
| 043048 | X | SPOROB | 2 | 043091 | Y | GNCH | 1 |
| 043057 | X | MUAS | 1 | | | | |
| 043057 | X | BRRU | 2 | | | | |
| 043057 | X | SPOROB | 1 | | | | |
| 043057 | X | GNCH | 14 | | | | |
| 043057 | X | JUTO | 1 | | | | |
| 043059 | X | ERCU | 1 | | | | |
| 043059 | X | ERIGER | 1 | | | | |
| 043059 | X | GNCH | 3 | | | | |
| 043060 | X | BRRU | 3 | | | | |
| 043060 | X | GNCH | 2 | | | | |
| 043063 | X | SPOROB | 4 | | | | |
| 043063 | X | JUAR | 5 | | | | |
| 043063 | X | GNCH | 1 | | | | |
| 043063 | X | JUTO | 4 | | | | |
| 043064 | X | GUTIERRZ | 1 | | | | |
| 043064 | X | SPOROB | 2 | | | | |
| 043064 | X | GNCH | 5 | | | | |
| 043064 | X | JUTO | 1 | | | | |
| 043064 | X | BRRU | 1 | | | | |
| 043092 | X | GNCH | 1 | | | | |
| 043092 | X | GRASS | 1 | | | | |
| 043092 | X | SPOROB | 7 | | | | |
| 043002 | Y | BRRU | 1 | | | | |
| 043003 | Y | GNCH | 5 | | | | |
| 043003 | Y | BRRU | 2 | | | | |
| 043008 | Y | TYDO | 5 | | | | |
| 043008 | Y | JUTO | 2 | | | | |
| 043008 | Y | JUAR | 1 | | | | |
| 043008 | Y | GNCH | 8 | | | | |
| 043008 | Y | BRRU | 6 | | | | |

Seed Bank Study: Pre- and Post-Flood Samples

Site: 51.2 L

| Polygon | Timing | Species | Number | 051022 | X | POMO | 4 |
|---------|--------|---------|--------|--------|---|------|-----|
| 051002 | X | AGSE | 3 | 051022 | X | PACA | 1 |
| 051002 | X | GNCH | 28 | 051022 | X | JUTO | 2 |
| 051003 | X | GNCH | 14 | 051022 | X | CEEX | 4 |
| 051003 | X | JUBA | 1 | 051022 | X | GNCH | 18 |
| 051007 | X | COCA | 1 | 051023 | X | PLMA | 8 |
| 051007 | X | GNCH | 1 | 051023 | X | VEAN | 25 |
| 051009 | X | GNCH | 2 | 051023 | X | VEAM | 2 |
| 051009 | X | HAAC | 7 | 051023 | X | TYDO | 1 |
| 051012 | X | VEAN | 1 | 051023 | X | GNCH | 37 |
| 051012 | X | BRRU | 1 | 051023 | X | JUAR | 13 |
| 051012 | X | GNCH | 15 | 051023 | X | JUTO | 2 |
| 051012 | X | JUTO | 2 | 051024 | X | BRRU | 1 |
| 051012 | X | AGST | 1 | 051024 | X | GNCH | 4 |
| 051013 | X | JUTO | 1 | 051024 | X | JUAR | 5 |
| 051013 | X | BRRU | 1 | 051024 | X | POMO | 2 |
| 051013 | X | GNCH | 14 | 051025 | X | COCA | 1 |
| 051013 | X | TYDO | 1 | 051025 | X | GNCH | 28 |
| 051014 | X | GNCH | 1 | 051025 | X | JUAR | 1 |
| 051014 | X | TYDO | 1 | 051025 | X | PACA | 1 |
| 051018 | X | BRWI | 1 | 051025 | X | PHAU | 1 |
| 051018 | X | ASSU | 2 | 051026 | X | CEEX | 1 |
| 051018 | X | GNCH | 8 | 051026 | X | GNCH | 47 |
| 051018 | X | JUBA | 1 | 051026 | X | VEAN | 1 |
| 051019 | X | AGSE | 1 | 051026 | X | TYDO | 2 |
| 051019 | X | ASSU | 2 | 051026 | X | POMO | 1 |
| 051019 | X | GNCH | 95 | 051026 | X | COCA | 2 |
| 051019 | X | BRWI | 1 | 051026 | X | AGSE | 1 |
| 051020 | X | POMO | 1 | 051027 | X | BRRU | 1 |
| 051020 | X | GNCH | 5 | 051027 | X | GNCH | 1 |
| 051020 | X | PLMA | 1 | 051027 | X | LEMO | 1 |
| 051020 | X | CYDA | 1 | 051029 | X | GNCH | 3 |
| 051020 | X | ASSU | 1 | 051029 | X | JUTO | 1 |
| 051021 | X | GNCH | 6 | 051029 | X | TYDO | 23 |
| 051021 | X | JUAR | 5 | 051029 | X | MUAS | 2 |
| 051021 | X | PLMA | 7 | 051030 | X | SOOC | 1 |
| 051021 | X | VEAN | 1 | 051030 | X | GNCH | 132 |
| 051022 | X | NAOF | 1 | 051030 | X | AGSE | 5 |
| 051022 | X | JUAR | 4 | 051031 | X | MUAS | 4 |

| | | | | | | | |
|--------|---|--------|----|--------|---|-------|----|
| 051031 | X | AGSE | 1 | 051002 | Y | GNCH | 5 |
| 051031 | X | COCA | 1 | 051003 | Y | GRASS | 1 |
| 051031 | X | BRRU | 1 | 051009 | Y | GNCH | 13 |
| 051031 | X | GNCH | 10 | 051009 | Y | VEAM | 1 |
| 051031 | X | POMO | 1 | 051013 | Y | GNCH | 1 |
| 051032 | X | GUTI | 1 | 051022 | Y | GNCH | 1 |
| 051032 | X | BRRU | 2 | 051042 | Y | GNCH | 1 |
| 051032 | X | COCA | 1 | 051051 | Y | MUAS | 1 |
| 051032 | X | GNCH | 14 | 051051 | Y | GNCH | 3 |
| 051036 | X | TYDO | 1 | 051064 | Y | GNCH | 3 |
| 051036 | X | GNCH | 4 | 051069 | Y | GNCH | 1 |
| 051036 | X | SAEX | 1 | 051071 | Y | GNCH | 79 |
| 051036 | X | AGSE | 2 | | | | |
| 051037 | X | GNCH | 10 | | | | |
| 051037 | X | JUTO | 1 | | | | |
| 051040 | X | GNCH | 5 | | | | |
| 051040 | X | COCA | 1 | | | | |
| 051041 | X | GNCH | 2 | | | | |
| 051042 | X | GNCH | 3 | | | | |
| 051043 | X | BAEM | 1 | | | | |
| 051043 | X | GNCH | 1 | | | | |
| 051044 | X | JUAR | 25 | | | | |
| 051044 | X | GNCH | 18 | | | | |
| 051044 | X | SPOROB | 5 | | | | |
| 051045 | X | GNCH | 6 | | | | |
| 051045 | X | NAOF | 1 | | | | |
| 051045 | X | COCA | 1 | | | | |
| 051045 | X | ERPE | 1 | | | | |
| 051050 | X | GNCH | 5 | | | | |
| 051050 | X | TYDO | 1 | | | | |
| 051050 | X | AGSE | 2 | | | | |
| 051050 | X | BASL | 1 | | | | |
| 051051 | X | BRRU | 1 | | | | |
| 051051 | X | GNCH | 9 | | | | |
| 051052 | X | BRRU | 9 | | | | |
| 051052 | X | LEMO | 1 | | | | |
| 051069 | X | GNCH | 69 | | | | |
| 051069 | X | JUAR | 1 | | | | |
| 051069 | X | JUTO | 2 | | | | |
| 051070 | X | GNCH | 45 | | | | |
| 051070 | X | POMO | 2 | | | | |
| 051071 | X | GNCH | 50 | | | | |
| 051071 | X | POMO | 1 | | | | |

Seed Bank Study: Pre- and Post-Flood Samples

Site: 55.5 R

| Polygon | Timing | Species | Number | 055016 | X | ASSU | 3 |
|---------|--------|---------|--------|--------|---|--------|----|
| 055001 | X | VUOC | 81 | 055016 | X | GRASS | 17 |
| 055001 | X | ARLU | 2 | 055016 | X | AGSE | 1 |
| 055001 | X | AGSE | 1 | 055017 | X | BAEM | 4 |
| 055002 | X | BAEM | 4 | 055017 | X | ECCR | 12 |
| 055002 | X | COCA | 10 | 055017 | X | BRWI | 6 |
| 055010 | X | AGSE | 1 | 055017 | X | AGSE | 1 |
| 055010 | X | CYDA | 11 | 055018 | X | ECCR | 12 |
| 055010 | X | AGSE | 1 | 055018 | X | ARLU | 2 |
| 055010 | X | BAEM | 4 | 055018 | X | ARLU | 2 |
| 055010 | X | ARLU | 2 | 055019 | X | ARLU | 2 |
| 055010 | X | MELIL | 23 | 055019 | X | BRWI | 6 |
| 055010 | X | ASSU | 3 | 055019 | X | MUAS | 24 |
| 055010 | X | AGSE | 1 | 055019 | X | CAAQ | 7 |
| 055010 | X | AGSE | 1 | 055019 | X | AGSE | 1 |
| 055011 | X | AGSE | 1 | 055019 | X | BAEM | 4 |
| 055011 | X | AGSE | 1 | 055019 | X | BAEM | 4 |
| 055011 | X | ARLU | 2 | 055019 | X | AGSE | 1 |
| 055011 | X | CAAQ | 7 | 055019 | X | AGSE | 1 |
| 055011 | X | JUTO | 22 | 055019 | X | BRWI | 6 |
| 055011 | X | ARLU | 2 | 055020 | X | AGSE | 1 |
| 055012 | X | CAAQ | 7 | 055020 | X | VUOC | 39 |
| 055012 | X | ARLU | 2 | 055020 | X | ARLU | 2 |
| 055012 | X | ARLU | 2 | 055020 | X | ERIGER | 15 |
| 055012 | X | CAAQ | 7 | 055020 | X | AGSE | 1 |
| 055012 | X | BRWI | 6 | 055021 | X | VUOC | 80 |
| 055012 | X | BRRU | 5 | 055021 | X | ARLU | 2 |
| 055012 | X | VUOC | 47 | 055021 | X | AGSE | 1 |
| 055012 | X | BAEM | 4 | 055021 | X | AGSE | 1 |
| 055012 | X | COCA | 10 | 055021 | X | ASSU | 3 |
| 055013 | X | GNCH | 16 | 055023 | X | BAEM | 4 |
| 055013 | X | ARLU | 2 | 055023 | X | ASSU | 3 |
| 055013 | X | AGSE | 1 | 055023 | X | ARLU | 2 |
| 055016 | X | AGSE | 1 | 055023 | X | AGSE | 1 |
| 055016 | X | AGSE | 1 | 055023 | X | CECA | 8 |
| 055016 | X | JUTO | 22 | 055023 | X | SAEX | 29 |
| 055016 | X | AGSE | 1 | 055023 | X | CAAQ | 7 |
| 055016 | X | CAAQ | 7 | 055024 | X | SOOC | 32 |
| 055016 | X | AGSE | 1 | 055024 | X | COCA | 10 |

| | | | | | | | |
|--------|---|------|----|--------|---|------|-----|
| 055024 | X | BRRU | 5 | 055034 | X | ARLU | 2 |
| 055024 | X | ARLU | 2 | 055034 | X | AGSE | 1 |
| 055025 | X | CYDA | 11 | 055034 | X | ARLU | 2 |
| 055025 | X | AGSE | 1 | 055034 | X | ASSU | 3 |
| 055025 | X | JUTO | 22 | 055034 | X | JUAR | 18 |
| 055025 | X | ASSU | 3 | 055034 | X | EQFE | 14 |
| 055025 | X | VUOC | 78 | 055035 | X | BRRU | 5 |
| 055025 | X | AGSE | 1 | 055035 | X | AGSE | 1 |
| 055026 | X | BRRU | 5 | 055035 | X | BAEM | 4 |
| 055026 | X | CEEX | 9 | 055035 | X | AGSE | 1 |
| 055026 | X | ARLU | 2 | 055035 | X | CAAQ | 7 |
| 055026 | X | AGSE | 1 | 055035 | X | BAEM | 4 |
| 055026 | X | SCPU | 30 | 055035 | X | ASSU | 3 |
| 055026 | X | JUAR | 18 | 055035 | X | CEEX | 9 |
| 055026 | X | ARLU | 2 | 055036 | X | CAAQ | 7 |
| 055026 | X | BRRU | 5 | 055036 | X | AGSE | 1 |
| 055026 | X | AGSE | 1 | 055036 | X | ARLU | 2 |
| 055026 | X | CECA | 8 | 055036 | X | ARLU | 2 |
| 055027 | X | CAAQ | 7 | 055036 | X | EQAR | 13 |
| 055027 | X | ARLU | 2 | 055036 | X | GNCH | 16 |
| 055027 | X | ASSU | 3 | 055037 | X | AGSE | 1 |
| 055027 | X | BRWI | 6 | 055037 | X | ASSU | 3 |
| 055027 | X | VUOC | 77 | 055037 | X | POMO | 28 |
| 055027 | X | AGSE | 1 | 055037 | X | ARLU | 2 |
| 055028 | X | VUOC | 53 | 055037 | X | AGSE | 1 |
| 055028 | X | AGSE | 1 | 055037 | X | ARLU | 2 |
| 055028 | X | AGSE | 1 | 055038 | X | AGSE | 1 |
| 055028 | X | ARLU | 2 | 055038 | X | AGSE | 1 |
| 055028 | X | AGSE | 1 | 055038 | X | AGSE | 1 |
| 055029 | X | CYDA | 11 | 055038 | X | ARLU | 2 |
| 055029 | X | VUOC | 56 | 055038 | X | VUOC | 39 |
| 055029 | X | AGSE | 1 | 055039 | X | BAEM | 4 |
| 055029 | X | AGSE | 1 | 055039 | X | CAAQ | 7 |
| 055032 | X | ARLU | 2 | 055039 | X | AGSE | 1 |
| 055032 | X | CAAQ | 7 | 055039 | X | AGSE | 1 |
| 055032 | X | BRWI | 6 | 055039 | X | VUOC | 130 |
| 055032 | X | AGSE | 1 | 055039 | X | AGSE | 1 |
| 055032 | X | AGSE | 1 | 055040 | X | ARLU | 2 |
| 055033 | X | PLLA | 26 | 055040 | X | AGSE | 1 |
| 055033 | X | EQFE | 14 | 055040 | X | ASSU | 3 |
| 055033 | X | AGSE | 1 | 055040 | X | VUOC | 42 |
| 055033 | X | AGSE | 1 | 055040 | X | BAEM | 4 |
| 055034 | X | AGSE | 1 | 055040 | X | BAEM | 4 |

| | | | | | | | |
|--------|---|------|----|--------|---|------|----|
| 055040 | X | ARLU | 2 | 055029 | Y | AGSE | 1 |
| 055045 | X | EQAR | 13 | 055045 | Y | JUEN | 21 |
| 055045 | X | ARLU | 2 | 055045 | Y | AGSE | 1 |
| 055045 | X | ARLU | 2 | 055045 | Y | AGSE | 1 |
| 055048 | X | ASSU | 3 | 055045 | Y | ASSU | 3 |
| 055049 | X | ASSU | 3 | 055048 | Y | AGSE | 1 |
| 055049 | X | JUEN | 21 | 055048 | Y | AGSE | 1 |
| 055049 | X | BRWI | 6 | 055048 | Y | AGSE | 1 |
| 055049 | X | AGSE | 1 | 055048 | Y | BRWI | 6 |
| 055049 | X | BRWI | 6 | 055056 | Y | ARLU | 2 |
| 055050 | X | AGSE | 1 | 055056 | Y | AGSE | 1 |
| 055050 | X | AGSE | 1 | | | | |
| 055050 | X | EQAR | 13 | | | | |
| 055050 | X | ARLU | 2 | | | | |
| 055055 | X | COCA | 10 | | | | |
| 055056 | X | AGSE | 1 | | | | |
| 055056 | X | ASSU | 3 | | | | |
| 055056 | X | AGSE | 1 | | | | |
| 055058 | X | ASSU | 3 | | | | |
| 055058 | X | ARLU | 2 | | | | |
| 055058 | X | AGSE | 1 | | | | |
| 055070 | X | ARLU | 2 | | | | |
| 055070 | X | AGSE | 1 | | | | |
| 055070 | X | AGSE | 1 | | | | |
| 055070 | X | AGSE | 1 | | | | |
| 055070 | X | JUTO | 22 | | | | |
| 055070 | X | ASSU | 3 | | | | |
| 055070 | X | AGSE | 1 | | | | |
| 055070 | X | ARLU | 2 | | | | |
| 055001 | Y | BAEM | 4 | | | | |
| 055002 | Y | CYDA | 11 | | | | |
| 055016 | Y | AGSE | 1 | | | | |
| 055017 | Y | BAEM | 4 | | | | |
| 055018 | Y | BAEM | 4 | | | | |
| 055018 | Y | AGSE | 1 | | | | |
| 055018 | Y | AGSE | 1 | | | | |
| 055019 | Y | AGSE | 1 | | | | |
| 055019 | Y | ARLU | 2 | | | | |
| 055019 | Y | AGSE | 1 | | | | |
| 055019 | Y | SAEX | 29 | | | | |
| 055027 | Y | AGSE | 1 | | | | |
| 055028 | Y | PLLA | 26 | | | | |
| 055029 | Y | VUOC | 39 | | | | |

Seed Bank Study: Pre- and Post-Flood Samples

Site: 68.1 R

| Polygon | Timing | Species | Number |
|---------|--------|---------|--------|
| 068003 | X | BRRU | 8 |
| 068011 | X | BRRU | 6 |
| 068019 | X | AGSE | 1 |
| 068019 | X | EQFE | 2 |
| 068019 | X | MELIL | 2 |
| 068020 | X | GNCH | 1 |
| 068022 | X | BRRU | 1 |
| 068022 | X | GNCH | 3 |
| 068022 | X | NAOF | 1 |
| 068025 | X | BRRU | 1 |
| 068027 | X | BRRU | 1 |
| 068029 | X | BRRU | 38 |
| 068031 | X | BRRU | 1 |
| 068031 | X | GNCH | 2 |
| 068040 | X | SPOROB | 5 |
| 068040 | X | COCA | 1 |
| 068040 | X | BRRU | 3 |
| 068040 | X | ASSU | 1 |
| 068041 | X | BRRU | 1 |
| 068042 | X | BRRU | 9 |
| 068044 | X | BRRU | 2 |
| 068045 | X | BRRU | 1 |
| 068045 | X | JUTO | 1 |
| 068045 | X | JUAR | 1 |
| 068046 | X | POMO | 2 |
| 068019 | Y | GNCH | 1 |
| 068022 | Y | GNCH | 1 |
| 068043 | Y | GNCH | 6 |

Seed Bank Study: Pre- and Post-Flood Samples

Site: 71.2 L

| Polygon | Timing | Species | Number | 072037 | X | POMO | 2 |
|---------|--------|---------|--------|--------|---|------|----|
| 072008 | X | GNCH | 1 | 072037 | X | SCPU | 1 |
| 072009 | X | BRRI | 1 | 072037 | X | AGST | 1 |
| 072009 | X | GNCH | 1 | 072038 | X | GNCH | 3 |
| 072013 | X | BRRU | 1 | 072038 | X | TYDO | 2 |
| 072013 | X | NAOF | 1 | 072039 | X | BRRU | 11 |
| 072014 | X | ALCA | 1 | 072039 | X | BRWI | 1 |
| 072014 | X | BRRU | 8 | 072039 | X | GNCH | 11 |
| 072014 | X | TYDO | 1 | 072039 | X | JUAR | 1 |
| 072020 | X | BRRU | 5 | 072040 | X | AGSE | 3 |
| 072021 | X | GNCH | 10 | 072040 | X | GNCH | 12 |
| 072022 | X | GNCH | 1 | 072040 | X | JUTO | 12 |
| 072027 | X | ALCA | 1 | 072040 | X | NAOF | 1 |
| 072027 | X | AGSE | 1 | 072042 | X | ALCA | 2 |
| 072027 | X | GNCH | 1 | 072044 | X | AGSE | 1 |
| 072027 | X | TYDO | 4 | 072044 | X | VEAN | 2 |
| 072028 | X | AGST | 3 | 072044 | X | BRRU | 1 |
| 072028 | X | GNCH | 8 | 072044 | X | GNCH | 10 |
| 072028 | X | POMO | 1 | 072044 | X | JUBA | 12 |
| 072028 | X | SCPU | 3 | 072044 | X | TYDO | 2 |
| 072028 | X | BAEM | 1 | 072048 | X | BRRU | 6 |
| 072028 | X | MELIL | 1 | 072048 | X | AGST | 2 |
| 072030 | X | COCA | 1 | 072048 | X | GNCH | 3 |
| 072030 | X | GNCH | 2 | 072049 | X | GNCH | 1 |
| 072030 | X | TYDO | 1 | 072049 | X | BRRU | 15 |
| 072032 | X | TYDO | 1 | 072049 | X | TYDO | 1 |
| 072033 | X | GNCH | 1 | 068009 | Y | GNCH | 2 |
| 072033 | X | SCPU | 1 | 068009 | Y | BRRU | 4 |
| 072033 | X | POMO | 3 | 068014 | Y | BRRU | 6 |
| 072033 | X | JUAR | 2 | 068022 | Y | GNCH | 1 |
| 072033 | X | BAEM | 2 | 068022 | Y | AGSE | 1 |
| 072035 | X | MUAS | 1 | 068022 | Y | BRRU | 1 |
| 072035 | X | JUTO | 7 | 068022 | Y | TYDO | 5 |
| 072035 | X | GNCH | 20 | 068027 | Y | GNCH | 1 |
| 072036 | X | GNCH | 1 | 068027 | Y | TYDO | 2 |
| 072036 | X | TYDO | 1 | 068028 | Y | GNCH | 1 |
| 072037 | X | GNCH | 82 | 068030 | Y | GNCH | 1 |
| 072037 | X | GRASS | 1 | 068035 | Y | GNCH | 5 |
| 072037 | X | NAOF | 1 | 068035 | Y | POMO | 2 |

| | | | |
|--------|---|------|----|
| 068036 | Y | GNCH | 8 |
| 068036 | Y | POMO | 1 |
| 068036 | Y | TYDO | 1 |
| 068038 | Y | TYDO | 1 |
| 068038 | Y | GNCH | 1 |
| 068038 | Y | POMO | 1 |
| 068039 | Y | TYDO | 1 |
| 068040 | Y | AGSE | 3 |
| 068040 | Y | BRRU | 1 |
| 068042 | Y | BRRU | 2 |
| 068043 | Y | BRRU | 3 |
| 068044 | Y | BRRU | 10 |
| 068044 | Y | POMO | 3 |
| 068044 | Y | GNCH | 7 |

Seed Bank Study: Pre- and Post-Flood Samples

Site: 93.9 L

| Polygon | Timing | Species | Number |
|---------|--------|---------|--------|
| 094002 | X | JUTO | 1 |
| 094003 | X | AGSE | 1 |
| 094003 | X | GNCH | 16 |
| 094003 | X | GRASS | 15 |
| 094003 | X | JUTO | 113 |
| 094004 | X | BAEM | 1 |
| 094004 | X | JUTO | 1 |
| 094004 | X | POMO | 1 |
| 094006 | X | AGSE | 2 |
| 094006 | X | ASSU | 1 |
| 094006 | X | BAEM | 2 |
| 094006 | X | BAEM | 1 |
| 094006 | X | BRRU | 1 |
| 094010 | X | JUTO | 3 |
| 094011 | X | BAEM | 4 |
| 094011 | X | BRRI | 4 |
| 094011 | X | BRRU | 21 |
| 094011 | X | GNCH | 1 |
| 094012 | X | TYDO | 1 |
| 094017 | X | BAEM | 4 |
| 094017 | X | BRRU | 1 |
| 094018 | X | BAEM | 13 |
| 094018 | X | BRRU | 1 |
| 094018 | X | GRASS | 1 |
| 094025 | X | TYDO | 1 |
| 094034 | X | MUAS | 1 |
| 094036 | X | TYDO | 1 |
| 094038 | X | BAEM | 1 |
| 094039 | X | AGSE | 1 |
| 094039 | X | BAEM | 2 |
| 094039 | X | TYDO | 2 |
| 094053 | X | ALCA | 2 |
| 094053 | X | BAEM | 2 |
| 094053 | X | BRRU | 1 |
| 094053 | X | COCA | 1 |
| 094053 | X | HOJU | 1 |
| 094053 | X | TYDO | 1 |

Seed Bank Study: Pre- and Post-Flood Samples

Site: 122.8 L

| Polygon | Timing | Species | Number | 123039 | X | COCA | 1 |
|---------|--------|---------|--------|--------|---|------|---|
| 123004 | X | HAAC | 3 | 123041 | X | BRRU | 1 |
| 123009 | X | GNCH | 1 | 123042 | X | BRRU | 1 |
| 123014 | X | GNCH | 1 | 123043 | X | HIRI | 1 |
| 123014 | X | BAEM | 5 | 123043 | X | BRRU | 1 |
| 123014 | X | BASL | 1 | 123046 | X | BRRU | 1 |
| 123014 | X | BRRU | 1 | 123046 | X | VUOC | 1 |
| 123015 | X | AGSE | 1 | 123051 | X | BRLN | 7 |
| 123017 | X | MELIL | 1 | 123052 | X | BRRU | 6 |
| 123017 | X | BRRU | 1 | 123012 | Y | BRRU | 4 |
| 123017 | X | EQFE | 6 | 123014 | Y | BRRU | 2 |
| 123017 | X | GNCH | 3 | 123017 | Y | POMO | 1 |
| 123019 | X | GNCH | 1 | 123026 | Y | BRRU | 1 |
| 123023 | X | PLPA | 1 | 123026 | Y | GNCH | 1 |
| 123023 | X | COCA | 1 | 123042 | Y | POMO | 1 |
| 123025 | X | NAOF | 1 | 123043 | Y | BRRU | 1 |
| 123025 | X | HAAC | 2 | | | | |
| 123025 | X | EQFE | 2 | | | | |
| 123025 | X | GNCH | 5 | | | | |
| 123025 | X | MELIL | 1 | | | | |
| 123025 | X | AGST | 1 | | | | |
| 123025 | X | AGSE | 2 | | | | |
| 123026 | X | SOAS | 2 | | | | |
| 123027 | X | AGSE | 1 | | | | |
| 123027 | X | POMO | 2 | | | | |
| 123027 | X | HAAC | 2 | | | | |
| 123027 | X | GNCH | 2 | | | | |
| 123028 | X | PLPA | 1 | | | | |
| 123029 | X | COCA | 1 | | | | |
| 123033 | X | AGSE | 2 | | | | |
| 123033 | X | JUTO | 1 | | | | |
| 123033 | X | POMO | 12 | | | | |
| 123034 | X | POMO | 11 | | | | |
| 123034 | X | COCA | 3 | | | | |
| 123038 | X | SOAS | 4 | | | | |
| 123038 | X | CYDA | 3 | | | | |
| 123038 | X | GNCH | 2 | | | | |
| 123039 | X | GNCH | 1 | | | | |
| 123039 | X | MELIL | 1 | | | | |

Seed Bank Study: Pre- and Post-Flood Samples

Site: 194 L

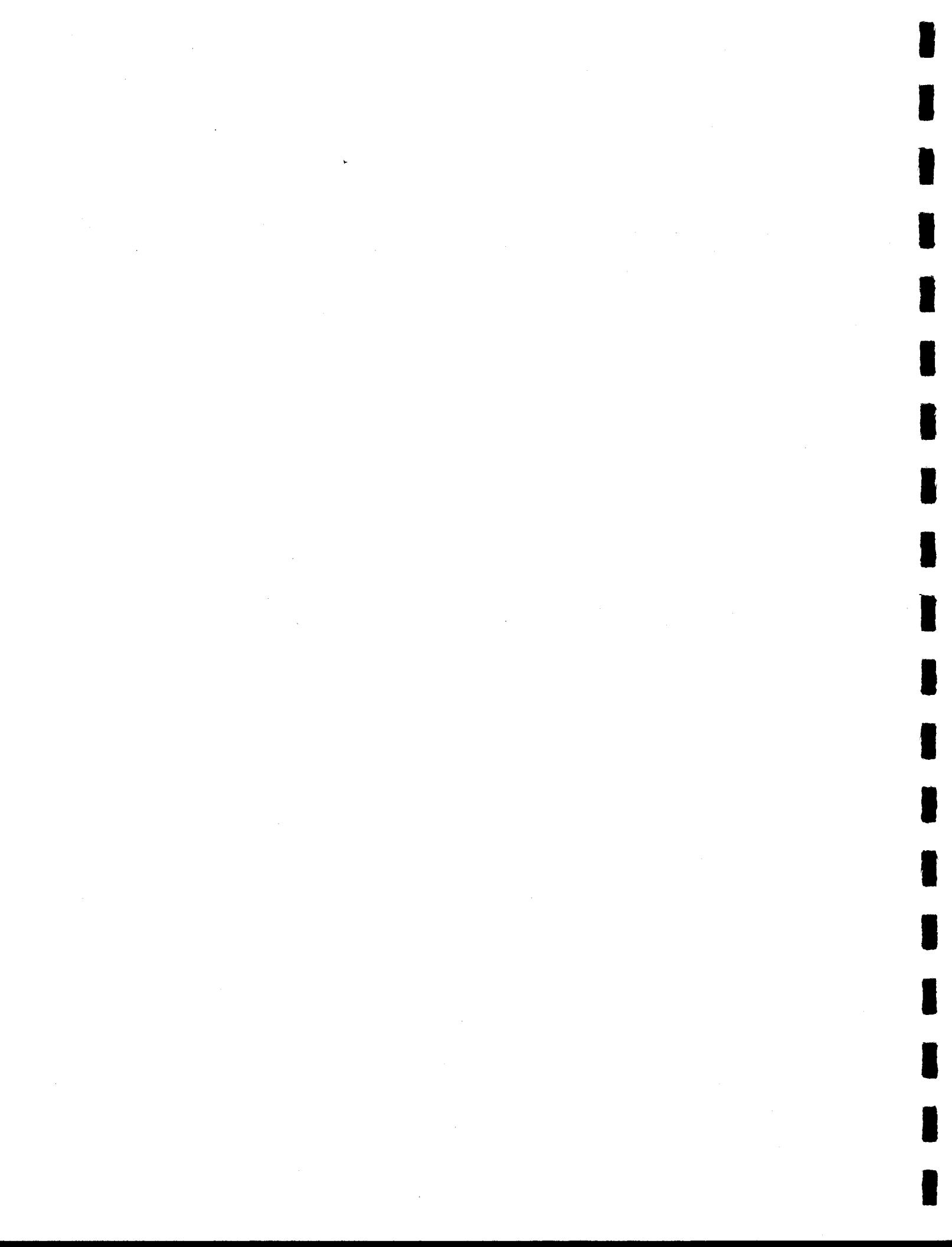
| Polygon | Timing | Species | Number | 194018 | X | ERIGER | 27 |
|---------|--------|---------|--------|--------|---|--------|----|
| 194002 | X | TYDO | 2 | 194018 | X | MUAS | 2 |
| 194003 | X | BRRU | 1 | 194018 | X | NAOF | 3 |
| 194003 | X | COCA | 5 | 194018 | X | TYDO | 1 |
| 194003 | X | JUTO | 2 | 194019 | X | BRRU | 4 |
| 194003 | X | MELIL | 3 | 194019 | X | COCA | 4 |
| 194003 | X | TYDO | 5 | 194019 | X | ERIGER | 10 |
| 194004 | X | GNCH | 3 | 194019 | X | NAOF | 1 |
| 194004 | X | SPOROB | 5 | 194019 | X | TYDO | 2 |
| 194004 | X | TYDO | 5 | 194020 | X | BRRU | 5 |
| 194005 | X | GNCH | 1 | 194020 | X | COCA | 7 |
| 194005 | X | TYDO | 1 | 194020 | X | ERIGER | 8 |
| 194007 | X | AGSE | 5 | 194020 | X | NAOF | 1 |
| 194007 | X | GNCH | 34 | 194021 | X | COCA | 1 |
| 194007 | X | GRASS | 4 | 194021 | X | NAOF | 2 |
| 194007 | X | NAOF | 1 | 194022 | X | BRRU | 3 |
| 194007 | X | TYDO | 11 | 194022 | X | COCA | 4 |
| 194010 | X | NAOF | 1 | 194022 | X | ERIGER | 6 |
| 194010 | X | POMO | 1 | 194022 | X | NAOF | 1 |
| 194010 | X | TYDO | 9 | 194023 | X | BRRU | 2 |
| 194012 | X | COCA | 1 | 194023 | X | NAOF | 1 |
| 194012 | X | MELIL | 1 | 194024 | X | NAOF | 3 |
| 194012 | X | NAOF | 4 | 194024 | X | TYDO | 4 |
| 194013 | X | BAEM | 2 | 194025 | X | GNCH | 49 |
| 194013 | X | COCA | 3 | 194025 | X | POMO | 1 |
| 194013 | X | NAOF | 2 | 194025 | X | VEAM | 1 |
| 194013 | X | PLMA | 24 | 194028 | X | AGSE | 1 |
| 194014 | X | CYDA | 2 | 194028 | X | CYDA | 1 |
| 194014 | X | GNCH | 3 | 194028 | X | NAOF | 3 |
| 194014 | X | MELL | 4 | 194029 | X | GNCH | 1 |
| 194014 | X | NAOF | 3 | 194029 | X | NAOF | 1 |
| 194014 | X | TYDO | 3 | 194030 | X | NAOF | 3 |
| 194015 | X | EQFE | 1 | 194032 | X | COCA | 1 |
| 194015 | X | NAOF | 3 | 194032 | X | GNCH | 1 |
| 194015 | X | TYDO | 8 | 194032 | X | NAOF | 6 |
| 194016 | X | NAOF | 3 | 194032 | X | TYDO | 3 |
| 194016 | X | TYDO | 1 | 194033 | X | AGSE | 1 |
| 194018 | X | BRRU | 1 | 194033 | X | BRRU | 1 |
| 194018 | X | COCA | 4 | 194033 | X | COCA | 1 |

| | | | | | | | |
|--------|---|--------|----|--------|---|------|----|
| 194033 | X | TYDO | 1 | 194003 | Y | TYDO | 1 |
| 194035 | X | GNCH | 1 | 194004 | Y | TYDO | 2 |
| 194040 | X | BRRU | 1 | 194004 | Y | VEAM | 1 |
| 194040 | X | NAOF | 2 | 194005 | Y | GNCH | 1 |
| 194041 | X | GNCH | 2 | 194005 | Y | TYDO | 11 |
| 194041 | X | NAOF | 1 | 194007 | Y | GNCH | 7 |
| 194042 | X | COCA | 1 | 194007 | Y | POMO | 1 |
| 194042 | X | ERIGER | 1 | 194007 | Y | TYDO | 12 |
| 194042 | X | GNCH | 2 | 194016 | Y | GNCH | 1 |
| 194042 | X | JUEN | 1 | 194016 | Y | MUAS | 1 |
| 194042 | X | TYDO | 1 | 194024 | Y | TYDO | 1 |
| 194043 | X | BAEM | 1 | 194025 | Y | BRRU | 5 |
| 194043 | X | GRASS | 1 | 194025 | Y | GNCH | 36 |
| 194049 | X | BRJA | 5 | 194025 | Y | POMO | 3 |
| 194049 | X | BRRU | 1 | 194032 | Y | BRRU | 1 |
| 194049 | X | ERIGER | 1 | 194032 | Y | TARA | 1 |
| 194049 | X | NAOF | 1 | 194032 | Y | TYDO | 2 |
| 194049 | X | TYDO | 1 | 194041 | Y | TYDO | 1 |
| 194050 | X | SPOROB | 10 | 194042 | Y | JUAR | 1 |
| 194051 | X | GNCH | 1 | 194055 | Y | VEAM | 1 |
| 194053 | X | AGSE | 10 | 194061 | Y | TYDO | 27 |
| 194053 | X | GNCH | 2 | | | | |
| 194053 | X | JUTO | 1 | | | | |
| 194053 | X | TYDO | 1 | | | | |
| 194054 | X | NAOF | 1 | | | | |
| 194054 | X | NITR | 1 | | | | |
| 194054 | X | TYDO | 1 | | | | |
| 194056 | X | GNCH | 2 | | | | |
| 194056 | X | GRASS | 2 | | | | |
| 194056 | X | JUTO | 2 | | | | |
| 194056 | X | NAOF | 1 | | | | |
| 194056 | X | TYDO | 4 | | | | |
| 194060 | X | POMO | 3 | | | | |
| 194060 | X | TYDO | 19 | | | | |
| 194061 | X | AGST | 1 | | | | |
| 194061 | X | ASSU | 1 | | | | |
| 194061 | X | MUAS | 1 | | | | |
| 194061 | X | POMO | 2 | | | | |
| 194061 | X | TYDO | 23 | | | | |
| 194072 | X | ASSU | 1 | | | | |
| 194072 | X | GNCH | 4 | | | | |
| 194072 | X | NAOF | 1 | | | | |
| 194072 | X | POMO | 4 | | | | |

Seed Bank Study: Pre- and Post-Flood Samples

Site: 209 L

| Polygon | Timing | Species | Number | 209041 | X | BRRU | 3 |
|---------|--------|---------|--------|--------|---|------|----|
| 209002 | X | NAOF | 1 | 209046 | X | COCA | 2 |
| 209004 | X | NAOF | 2 | 209046 | X | NAOF | 2 |
| 209013 | X | BRRU | 2 | 209047 | X | ALCA | 4 |
| 209013 | X | MUAS | 1 | 209047 | X | GNCH | 1 |
| 209015 | X | VUOC | 1 | 209047 | X | NAOF | 1 |
| 209021 | X | AGSE | 1 | 209047 | X | POAN | 1 |
| 209022 | X | BRRU | 1 | 209048 | X | ALCA | 3 |
| 209023 | X | COCA | 1 | 209048 | X | BRRU | 1 |
| 209023 | X | NAOF | 2 | 209048 | X | NAOF | 1 |
| 209023 | X | TYDO | 1 | 209054 | X | CECA | 1 |
| 209024 | X | NAOF | 2 | 209054 | X | COCA | 4 |
| 209028 | X | ASSU | 3 | 209054 | X | SOAS | 1 |
| 209028 | X | COCA | 3 | 209055 | X | AGSE | 1 |
| 209029 | X | ASSU | 2 | 209055 | X | POMO | 1 |
| 209029 | X | CYDA | 2 | 209056 | X | BRRU | 2 |
| 209029 | X | GNCH | 3 | 209062 | X | EQFE | 1 |
| 209030 | X | ASSU | 1 | 209064 | X | COCA | 2 |
| 209030 | X | CECA | 1 | 209064 | X | GNCH | 3 |
| 209030 | X | COCA | 28 | 209067 | X | HAAC | 2 |
| 209030 | X | GNCH | 1 | 209003 | Y | BRRU | 1 |
| 209030 | X | JUBA | 1 | 209011 | Y | BRRI | 1 |
| 209030 | X | JUTO | 3 | 209013 | Y | BRRU | 6 |
| 209031 | X | COCA | 2 | 209036 | Y | CYDA | 1 |
| 209031 | X | GNCH | 1 | 209046 | Y | BRRU | 5 |
| 209031 | X | POMO | 1 | 209046 | Y | MUAS | 1 |
| 209032 | X | GNCH | 2 | 209047 | Y | TARA | 1 |
| 209032 | X | NAOF | 2 | 209054 | Y | BRRU | 2 |
| 209034 | X | GNCH | 1 | 209054 | Y | GNCH | 12 |
| 209034 | X | LELA | 1 | 209056 | Y | BRRU | 1 |
| 209035 | X | AGSE | 3 | 209064 | Y | JUAR | 5 |
| 209035 | X | MELIL | 4 | 209065 | Y | BRRU | 1 |
| 209038 | X | AGSE | 1 | | | | |
| 209038 | X | AGST | 1 | | | | |
| 209038 | X | COCA | 2 | | | | |
| 209038 | X | JUAR | 2 | | | | |
| 209038 | X | NAOF | 1 | | | | |
| 209039 | X | BRRU | 1 | | | | |
| 209039 | X | GNCH | 2 | | | | |



Appendix F

Marsh Transect Point Elevations Surveyed in February and April of 1996

These data were pulled from sandbar surface models produced by members of the N.A.U. Sandbar Dynamics group and the G.C.E.S. / G.C.M.R.C. Survey Department. They represent elevations, relative to a local benchmark and survey control of fixed coordinates. The data are organized within the seven sites where both pre- and post-flood data are available. The data columns are as follows:

TRANSECT: The name of the transect across the return-current channel or low sandbar.

Naming conventions are described in the Methods section.

#: The number of the point along the transect. Numbering of points began at 0 at the talus side and increased towards the beach side. At 55 R (Kwagunt Marsh) numbers are relative to a baseline, but still increase from the talus side stake towards the river.

OFFSET: The distance, in meters, from the talus side stake to the point. In all cases except for river side points, this is in whole meters.

PRE-FLOOD: The elevation, in meters, relative to a local benchmark (= 100.000 m) and survey control of the sample point in February 1996.

POST-FLOOD: As above, in April 1996.

Marsh Transect Elevations

Site: 43 L

| Trans | # | Offset | Pre-Flood | Post-Flood | D | 4 | 4.0 | 98.713 | 98.884 |
|-------|----|--------|-----------|------------|---|----|------|--------|---------|
| A | 0 | 0 | 100.024 | 100.011 | D | 5 | 5.0 | 98.855 | 98.944 |
| A | 1 | 1.0 | 99.666 | 99.861 | D | 6 | 6.0 | 98.987 | 99.119 |
| A | 2 | 2.0 | 99.425 | 99.686 | D | 7 | 7.0 | 99.137 | 99.297 |
| A | 3 | 3.0 | 99.206 | 99.510 | D | 8 | 8.0 | 99.301 | 99.476 |
| A | 4 | 4.0 | 99.146 | 99.335 | D | 9 | 9.0 | 99.447 | 99.618 |
| A | 5 | 5.0 | 99.179 | 99.218 | D | 10 | 10.0 | 99.492 | 99.672 |
| A | 6 | 6.0 | 99.245 | 99.260 | D | 11 | 11.0 | 99.499 | 99.682 |
| A | 7 | 7.0 | 99.520 | 99.519 | D | 12 | 12.0 | 99.475 | 99.693 |
| A | 8 | 8.1 | 99.828 | 99.813 | D | 13 | 13.0 | 99.438 | 99.814 |
| B | 0 | 0.0 | 99.331 | 99.431 | D | 14 | 14.0 | 99.470 | 99.996 |
| B | 1 | 1.0 | 99.152 | 99.088 | D | 15 | 14.8 | 99.583 | 100.069 |
| B | 2 | 2.0 | 98.994 | 98.998 | E | 0 | 0.0 | 99.331 | 99.624 |
| B | 3 | 3.0 | 98.985 | 98.969 | E | 1 | 1.0 | 98.808 | 99.159 |
| B | 4 | 4.0 | 98.990 | 98.987 | E | 2 | 2.0 | 98.697 | 98.789 |
| B | 5 | 5.0 | 98.900 | 99.005 | E | 3 | 3.0 | 98.753 | 98.931 |
| B | 6 | 6.0 | 98.961 | 99.017 | E | 4 | 4.0 | 98.871 | 99.069 |
| B | 7 | 7.0 | 99.000 | 99.027 | E | 5 | 5.0 | 98.984 | 99.188 |
| B | 8 | 8.0 | 99.024 | 99.117 | E | 6 | 6.0 | 99.064 | 99.286 |
| B | 9 | 9.0 | 99.133 | 99.217 | E | 7 | 7.0 | 99.117 | 99.383 |
| B | 10 | 10.0 | 99.355 | 99.397 | E | 8 | 8.0 | 99.166 | 99.480 |
| B | 11 | 11.0 | 99.620 | 99.622 | E | 9 | 9.0 | 99.239 | 99.573 |
| C | 0 | 0.0 | 99.795 | 99.656 | E | 10 | 10.0 | 99.297 | 99.676 |
| C | 1 | 1.0 | 99.239 | 99.331 | E | 11 | 11.0 | 99.401 | 99.783 |
| C | 2 | 2.0 | 98.833 | 99.021 | E | 12 | 12.0 | 99.483 | 99.889 |
| C | 3 | 3.0 | 98.689 | 98.755 | E | 13 | 13.4 | 99.611 | 100.048 |
| C | 4 | 4.0 | 98.637 | 98.739 | F | 0 | 0.0 | 99.575 | 99.599 |
| C | 5 | 5.0 | 98.592 | 98.722 | F | 1 | 1.0 | 99.095 | 99.274 |
| C | 6 | 6.0 | 98.590 | 98.730 | F | 2 | 2.0 | 98.836 | 99.004 |
| C | 7 | 7.0 | 98.598 | 98.818 | F | 3 | 3.0 | 98.712 | 98.897 |
| C | 8 | 8.0 | 98.784 | 98.883 | F | 4 | 4.0 | 98.644 | 98.806 |
| C | 9 | 9.0 | 98.845 | 99.031 | F | 5 | 5.0 | 98.768 | 98.918 |
| C | 10 | 10.0 | 98.996 | 99.179 | F | 6 | 6.0 | 98.854 | 99.029 |
| C | 11 | 11.0 | 99.145 | 99.329 | F | 7 | 7.0 | 98.911 | 99.140 |
| C | 12 | 12.0 | 99.311 | 99.529 | F | 8 | 8.0 | 98.966 | 99.251 |
| C | 13 | 13.0 | 99.504 | 99.699 | F | 9 | 9.0 | 99.036 | 99.384 |
| D | 0 | 0.0 | 99.726 | 99.728 | F | 10 | 10.0 | 99.214 | 99.536 |
| D | 1 | 1.0 | 99.181 | 99.334 | F | 11 | 11.0 | 99.320 | 99.685 |
| D | 2 | 2.0 | 98.889 | 98.946 | F | 12 | 11.9 | 99.525 | 99.818 |
| D | 3 | 3.0 | 98.783 | 98.874 | G | 0 | 0.0 | 99.621 | 99.621 |

| | | | | |
|---|----|------|--------|--------|
| G | 1 | 1.0 | 99.225 | 99.768 |
| G | 2 | 2.0 | 98.993 | 99.269 |
| G | 3 | 3.0 | 98.709 | 98.946 |
| G | 4 | 4.0 | 98.521 | 98.853 |
| G | 5 | 5.0 | 98.441 | 98.773 |
| G | 6 | 6.0 | 98.539 | 98.745 |
| G | 7 | 7.0 | 98.665 | 98.910 |
| G | 8 | 8.0 | 98.811 | 99.076 |
| G | 9 | 9.0 | 98.967 | 99.242 |
| G | 10 | 9.9 | 99.134 | 99.394 |
| H | 0 | 0.0 | 98.929 | 99.091 |
| H | 1 | 1.0 | 98.544 | 98.831 |
| H | 2 | 2.0 | 98.318 | 98.571 |
| H | 3 | 3.0 | 98.286 | 98.517 |
| H | 4 | 4.0 | 98.314 | 98.669 |
| H | 5 | 5.0 | 98.449 | 98.822 |
| H | 6 | 6.0 | 98.599 | 98.974 |
| H | 7 | 7.0 | 98.749 | 99.141 |
| H | 8 | 8.0 | 98.944 | 99.333 |
| H | 9 | 9.0 | 99.100 | 99.562 |
| H | 10 | 10.0 | 99.3 | 99.766 |
| H | 11 | 10.4 | 99.378 | 99.847 |
| I | 0 | 0.0 | 99.312 | 99.474 |
| I | 1 | 1.0 | 98.718 | 99.181 |
| I | 2 | 2.0 | 98.266 | 98.342 |
| I | 3 | 3.0 | 98.198 | 98.277 |
| I | 4 | 4.0 | 98.138 | 98.258 |
| I | 5 | 5.0 | 98.269 | 98.328 |
| I | 6 | 6.0 | 98.371 | 98.434 |
| I | 7 | 7.0 | 98.53 | 98.577 |
| I | 8 | 8.0 | 98.73 | 98.811 |
| J | 0 | 0.0 | 99.255 | 99.523 |
| J | 1 | 1.0 | 99.014 | 98.988 |
| J | 2 | 2.0 | 98.26 | 98.414 |
| J | 3 | 3.0 | 98.126 | 98.243 |
| J | 4 | 4.0 | 98.131 | 98.175 |
| J | 5 | 5.0 | 98.148 | 98.423 |
| J | 6 | 6.0 | 98.222 | 98.555 |
| J | 7 | 7.0 | 98.331 | 98.688 |
| J | 8 | 8.0 | 98.445 | 98.926 |
| J | 9 | 9.0 | 98.588 | 98.932 |
| J | 10 | 10.0 | 98.697 | 99.153 |
| J | 11 | 11.2 | 98.964 | 99.570 |

Marsh Transect Elevations

Site: 51 L

| Trans | # | Offset | Pre-Flood | Post-Flood | | D | 1 | 1.0 | 99.379 | 99.453 |
|-------|----|--------|-----------|------------|--|---|----|------|---------|---------|
| A | 0 | 0 | 100.992 | 100.992 | | D | 2 | 2.0 | 99.348 | 99.508 |
| A | 1 | 1.0 | 100.370 | 100.400 | | D | 3 | 3.0 | 99.477 | 99.652 |
| A | 2 | 2.0 | 99.878 | 99.909 | | D | 4 | 4.0 | 99.664 | 99.794 |
| A | 3 | 3.0 | 99.788 | 99.889 | | D | 5 | 5.0 | 99.788 | 99.936 |
| A | 4 | 4.0 | 99.829 | 99.869 | | D | 6 | 6.0 | 99.876 | 100.053 |
| A | 5 | 5.0 | 99.814 | 99.849 | | D | 7 | 7.0 | 99.924 | 100.141 |
| A | 6 | 6.0 | 99.778 | 99.828 | | D | 8 | 8.0 | 100.056 | 100.23 |
| A | 7 | 7.0 | 99.817 | 99.808 | | D | 9 | 9.0 | 100.222 | 100.313 |
| A | 8 | 8.0 | 99.872 | 99.788 | | D | 10 | 10.0 | 100.300 | 100.396 |
| A | 9 | 9.0 | 99.976 | 99.844 | | D | 11 | 10.7 | 100.375 | 100.458 |
| A | 10 | 10.0 | 100.210 | 100.110 | | E | 0 | 0.0 | 99.376 | 99.421 |
| A | 11 | 11.0 | 100.444 | 100.376 | | E | 1 | 1.0 | 99.018 | 99.252 |
| A | 12 | 12.2 | 100.531 | 100.554 | | E | 2 | 2.0 | 99.028 | 99.274 |
| B | 0 | 0.0 | 100.397 | 100.638 | | E | 3 | 3.0 | 99.166 | 99.501 |
| B | 1 | 1.0 | 99.798 | 100.281 | | E | 4 | 4.0 | 99.314 | 99.899 |
| B | 2 | 2.0 | 99.559 | 99.924 | | E | 5 | 5.0 | 99.578 | 100.333 |
| B | 3 | 3.0 | 99.457 | 99.568 | | E | 6 | 6.0 | 99.835 | 100.729 |
| B | 4 | 4.0 | 99.400 | 99.502 | | E | 7 | 7.0 | 100.045 | 100.988 |
| B | 5 | 5.0 | 99.485 | 99.564 | | E | 8 | 8.0 | 100.255 | 101.142 |
| B | 6 | 6.0 | 99.563 | 99.627 | | E | 9 | 9.0 | 100.369 | 101.145 |
| B | 7 | 7.0 | 99.682 | 99.692 | | F | 0 | 0.0 | 99.509 | 99.692 |
| B | 8 | 8.0 | 100.038 | 99.983 | | F | 1 | 1.0 | 98.927 | 99.408 |
| B | 9 | 9.0 | 100.354 | 100.312 | | F | 2 | 2.0 | 98.833 | 99.218 |
| B | 10 | 10.0 | 100.647 | 100.662 | | F | 3 | 3.0 | 98.786 | 99.005 |
| B | 11 | 11.0 | 100.908 | 100.885 | | F | 4 | 4.0 | 98.730 | 98.950 |
| B | 12 | 12.0 | 101.065 | 101.016 | | F | 5 | 5.0 | 98.827 | 99.025 |
| B | 13 | 12.8 | 101.146 | 101.152 | | F | 6 | 6.0 | 98.981 | 99.199 |
| C | 0 | 0.0 | 100.293 | 100.470 | | F | 7 | 7.0 | 99.140 | 99.412 |
| C | 1 | 1.0 | 99.735 | 99.934 | | F | 8 | 8.0 | 99.353 | 99.630 |
| C | 2 | 2.0 | 99.520 | 99.669 | | F | 9 | 9.0 | 99.595 | 99.848 |
| C | 3 | 3.0 | 99.443 | 99.698 | | F | 10 | 10.0 | 99.847 | 100.067 |
| C | 4 | 4.0 | 99.484 | 99.726 | | F | 11 | 11.0 | 100.029 | 100.292 |
| C | 5 | 5.0 | 99.551 | 99.755 | | F | 12 | 12.0 | 100.195 | 100.451 |
| C | 6 | 6.0 | 99.698 | 99.898 | | F | 13 | 12.5 | 100.278 | 100.515 |
| C | 7 | 7.0 | 99.908 | 100.166 | | G | 0 | 0.0 | 100.039 | 100.727 |
| C | 8 | 8.0 | 100.209 | 100.434 | | G | 1 | 1.0 | 99.779 | 100.015 |
| C | 9 | 9.0 | 100.435 | 100.684 | | G | 2 | 2.0 | 99.519 | 99.541 |
| C | 10 | 10.0 | 100.807 | 100.925 | | G | 3 | 3.0 | 99.258 | 99.312 |
| D | 0 | 0.0 | 99.553 | 99.495 | | G | 4 | 4.0 | 98.817 | 99.082 |

| | | | | |
|---|----|------|---------|---------|
| G | 5 | 5.0 | 98.658 | 98.864 |
| G | 6 | 6.0 | 98.421 | 98.658 |
| G | 7 | 7.0 | 98.277 | 98.662 |
| G | 8 | 8.0 | 98.419 | 98.664 |
| G | 9 | 9.0 | 98.608 | 98.895 |
| G | 10 | 10.0 | 98.773 | 99.070 |
| G | 11 | 11.0 | 98.904 | 99.260 |
| G | 12 | 12.0 | 99.082 | 99.448 |
| G | 13 | 13.0 | 99.259 | 99.741 |
| H | 0 | 0.0 | 99.476 | 99.627 |
| H | 1 | 1.0 | 99.267 | 99.578 |
| H | 2 | 2.0 | 99.238 | 99.529 |
| H | 3 | 3.0 | 99.286 | 99.480 |
| H | 4 | 4.0 | 99.010 | 99.037 |
| H | 5 | 5.0 | 98.723 | 98.844 |
| H | 6 | 6.0 | 98.809 | 99.013 |
| H | 7 | 7.0 | 98.913 | 99.123 |
| H | 8 | 8.0 | 99.021 | 99.266 |
| H | 9 | 9.0 | 99.150 | 99.429 |
| H | 10 | 10.0 | 99.205 | 99.5932 |
| H | 11 | 10.5 | 99.313 | 99.675 |
| I | 0 | 0.0 | 99.994 | 100.354 |
| I | 1 | 1.0 | 99.593 | 99.661 |
| I | 2 | 2.0 | 99.089 | 99.249 |
| I | 3 | 3.0 | 98.763 | 98.922 |
| I | 4 | 4.0 | 98.607 | 98.857 |
| I | 5 | 5.0 | 98.680 | 98.926 |
| I | 6 | 6.0 | 98.845 | 99.192 |
| I | 7 | 7.0 | 99.107 | 99.462 |
| I | 8 | 8.0 | 99.376 | 99.602 |
| I | 9 | 9.0 | 99.571 | 99.794 |
| J | 0 | 0.0 | 100.178 | 100.19 |
| J | 1 | 1.0 | 100.006 | 100.168 |
| J | 2 | 2.0 | 99.705 | 99.988 |
| J | 3 | 3.0 | 99.373 | 99.674 |
| J | 4 | 4.0 | 99.148 | 99.355 |
| J | 5 | 5.0 | 98.936 | 99.019 |
| J | 6 | 6.0 | 98.716 | 98.815 |
| J | 7 | 7.0 | 98.709 | 98.812 |
| J | 8 | 8.0 | 98.785 | 98.903 |
| J | 9 | 9.0 | 98.885 | 98.994 |
| J | 10 | 10.4 | 99.052 | 99.127 |

Marsh Transect Elevations

Site: 55 R

| Trans | # | Offset | Pre-Flood | Post-Flood | F | 4 | 60.0 | 93.318 | 94.418 |
|-------|----|--------|-----------|------------|---|----|------|--------|--------|
| A | 1 | 0 | 93.028 | 94.040 | F | 5 | 69.7 | 92.896 | 93.387 |
| A | 2 | 10.0 | 93.145 | 94.111 | G | -2 | 0.0 | 93.295 | 93.395 |
| A | 3 | 20.0 | 93.151 | 93.769 | G | -1 | 10.0 | 93.685 | 93.578 |
| A | 4 | 30.0 | 93.186 | 92.520 | G | 0 | 20.0 | 93.140 | 93.493 |
| A | 5 | 40.0 | 92.465 | 91.633 | G | 1 | 30.0 | 93.093 | 94.341 |
| A | 6 | 49.9 | 92.709 | 91.081 | G | 2 | 40.0 | 93.070 | 94.469 |
| B | 1 | 0.0 | 93.054 | 94.083 | G | 3 | 50.0 | 93.231 | 94.563 |
| B | 2 | 10.0 | 93.033 | 93.924 | G | 4 | 60.0 | 93.277 | 94.081 |
| B | 3 | 20.0 | 93.044 | 93.806 | G | 5 | 68.5 | 92.686 | 93.225 |
| B | 4 | 30.0 | 93.132 | 93.469 | H | -2 | 0.0 | 92.782 | 92.898 |
| B | 5 | 40.0 | 92.418 | 92.383 | H | -1 | 10.0 | 94.275 | 94.192 |
| B | 6 | 49.9 | 92.295 | 91.818 | H | 0 | 20.0 | 93.470 | 93.561 |
| C | 1 | 0.0 | 92.878 | 94.455 | H | 1 | 30.0 | 93.069 | 93.480 |
| C | 2 | 10.0 | 92.986 | 94.325 | H | 2 | 40.0 | 93.186 | 94.313 |
| C | 3 | 20.0 | 92.972 | 94.102 | H | 3 | 50.0 | 93.194 | 94.559 |
| C | 4 | 30.0 | 93.098 | 93.817 | H | 4 | 60.0 | 93.179 | 93.918 |
| C | 5 | 39.8 | 92.424 | 93.220 | H | 5 | 69.2 | 92.638 | 92.799 |
| D | -2 | 0.0 | 94.072 | 93.735 | I | -2 | 0.0 | 92.912 | 93.015 |
| D | -1 | 10.0 | 94.234 | 94.250 | I | -1 | 10.0 | 94.589 | 94.458 |
| D | 0 | 20.0 | 92.104 | 92.523 | I | 0 | 20.0 | 93.672 | 93.713 |
| D | 1 | 30.0 | 92.816 | 94.330 | I | 1 | 30.0 | 93.020 | 93.251 |
| D | 2 | 40.0 | 92.936 | 94.368 | I | 2 | 40.0 | 93.249 | 93.761 |
| D | 3 | 50.0 | 93.016 | 94.381 | I | 3 | 50.0 | 93.138 | 94.301 |
| D | 4 | 60.0 | 93.157 | 94.326 | I | 4 | 60.0 | 93.080 | 93.659 |
| D | 5 | 69.6 | 92.474 | 93.641 | I | 5 | 69.1 | 91.940 | 92.300 |
| E | -2 | 0.0 | 93.838 | 93.867 | J | -2 | 0.0 | 92.890 | 92.811 |
| E | -1 | 10.0 | 93.423 | 93.423 | J | -1 | 10.0 | 94.612 | 94.607 |
| E | 0 | 20.0 | 92.578 | 93.009 | J | 0 | 20.0 | 93.663 | 93.620 |
| E | 1 | 30.0 | 93.047 | 94.367 | J | 1 | 30.0 | 92.941 | 93.045 |
| E | 2 | 40.0 | 93.159 | 94.477 | J | 2 | 40.0 | 93.135 | 93.582 |
| E | 3 | 50.0 | 93.230 | 94.522 | J | 3 | 50.0 | 93.112 | 94.333 |
| E | 4 | 60.0 | 93.131 | 94.422 | J | 4 | 59.3 | 92.897 | 93.445 |
| E | 5 | 69.2 | 92.941 | 93.645 | K | -2 | 0.0 | 93.297 | 93.461 |
| F | -2 | 0.0 | 93.627 | 93.422 | K | -1 | 10.0 | 94.343 | 94.360 |
| F | -1 | 10.0 | 92.989 | 93.065 | K | 0 | 20.0 | 93.584 | 93.623 |
| F | 0 | 20.0 | 92.870 | 93.379 | K | 1 | 30.0 | 92.970 | 93.035 |
| F | 1 | 30.0 | 92.990 | 93.923 | K | 2 | 40.0 | 93.144 | 93.300 |
| F | 2 | 40.0 | 93.073 | 94.480 | K | 3 | 50.0 | 93.045 | 93.383 |
| F | 3 | 50.0 | 93.242 | 94.504 | K | 4 | 59.3 | 92.575 | 93.184 |

| Trans | # | Offset | Pre-Flood | Post-Flood | | | | | |
|-------|----|--------|-----------|------------|----|---|------|--------|--------|
| L | -2 | 0.0 | 93.970 | 94.278 | Y | 6 | 50.0 | 91.185 | 89.810 |
| L | -1 | 10.0 | 94.019 | 93.965 | Z | 1 | 0.0 | 93.554 | 92.197 |
| L | 0 | 20.0 | 94.090 | 93.928 | Z | 2 | 10.0 | 92.761 | 89.643 |
| L | 1 | 30.0 | 93.127 | 93.074 | Z | 3 | 19.9 | 92.734 | 89.715 |
| L | 2 | 40.0 | 93.009 | 92.980 | ZZ | 1 | 0.0 | 92.689 | 93.633 |
| L | 3 | 50.0 | 92.956 | 93.125 | ZZ | 2 | 10.0 | 92.795 | 91.056 |
| L | 4 | 58.5 | 92.396 | 92.225 | ZZ | 3 | 20.0 | 92.646 | 88.998 |
| M | -2 | 1.0 | 94.429 | 94.318 | ZZ | 4 | 29.9 | 92.502 | 89.821 |
| M | -1 | 10.0 | 93.749 | 93.670 | | | | | |
| M | 0 | 20.0 | 94.036 | 94.040 | | | | | |
| M | 1 | 30.0 | 93.163 | 93.163 | | | | | |
| M | 2 | 40.0 | 93.035 | 93.002 | | | | | |
| M | 3 | 49.2 | 92.868 | 92.932 | | | | | |
| N | -1 | 0.0 | 93.157 | 93.070 | | | | | |
| N | 0 | 10.0 | 94.128 | 94.099 | | | | | |
| N | 1 | 20.0 | 93.291 | 93.320 | | | | | |
| N | 2 | 29.6 | 92.997 | 93.006 | | | | | |
| O | -1 | 0.0 | 92.619 | 92.693 | | | | | |
| O | 0 | 10.0 | 94.153 | 94.047 | | | | | |
| O | 1 | 20.0 | 93.241 | 93.232 | | | | | |
| O | 2 | 30.0 | 92.986 | 93.049 | | | | | |
| P | -1 | 0.0 | 92.665 | 92.929 | | | | | |
| P | 0 | 10.0 | 92.947 | 92.988 | | | | | |
| P | 1 | 20.0 | 93.172 | 93.205 | | | | | |
| P | 2 | 30.3 | 92.973 | 93.331 | | | | | |
| Q | 0 | 0.0 | 92.181 | 92.341 | | | | | |
| Q | 1 | 10.0 | 93.444 | 93.637 | | | | | |
| Q | 2 | 20.0 | 92.948 | 92.919 | | | | | |
| R | 0 | 0.0 | 92.687 | 93.231 | | | | | |
| R | 1 | 10.0 | 92.713 | 93.073 | | | | | |
| R | 2 | 20.0 | 92.350 | 91.254 | | | | | |
| X | 1 | 0.0 | 93.187 | 94.325 | | | | | |
| X | 2 | 10.0 | 93.305 | 94.285 | | | | | |
| X | 3 | 20.0 | 93.222 | 93.520 | | | | | |
| X | 4 | 30.0 | 92.894 | 90.841 | | | | | |
| X | 5 | 40.0 | 92.542 | 91.338 | | | | | |
| X | 6 | 49.7 | 91.681 | 90.472 | | | | | |
| Y | 1 | 0.0 | 93.149 | 94.405 | | | | | |
| Y | 2 | 10.0 | 93.158 | 93.950 | | | | | |
| Y | 3 | 20.0 | 92.994 | 90.532 | | | | | |
| Y | 4 | 30.0 | 92.974 | 90.362 | | | | | |
| Y | 5 | 40.0 | 92.563 | 90.680 | | | | | |

Marsh Transect Elevations

Site: 123 R

| Trans | # | Offset | Pre-Flood | Post-Flood |
|-------|---|--------|-----------|------------|
| A | 1 | 0 | 102.068 | 102.300 |
| A | 1 | 1 | 101.526 | 101.892 |
| A | 2 | 2 | 101.394 | 102.143 |
| A | 3 | 3 | 101.808 | 102.557 |
| A | 4 | 4 | 102.270 | 102.780 |
| A | 5 | 5.2 | 102.264 | 102.850 |
| B | 0 | 0 | 101.804 | 101.814 |
| B | 1 | 1 | 101.114 | 101.315 |
| B | 2 | 2 | 101.147 | 100.792 |
| B | 3 | 3 | 101.470 | 99.887 |
| B | 4 | 4 | 101.859 | 99.697 |
| B | 5 | 5 | 102.259 | 99.861 |
| C | 0 | 0 | 101.678 | 101.885 |
| C | 1 | 1 | 100.996 | 101.133 |
| C | 2 | 2 | 101.126 | 99.535 |
| D | 0 | 0 | 101.839 | 102.041 |
| D | 1 | 1 | 101.252 | 101.569 |
| D | 2 | 2 | 101.061 | 101.067 |
| D | 3 | 2.7 | 100.953 | 100.683 |

Marsh Transect Elevations

Site: 194 L

| Trans | # | Offset | Pre-Flood | Post-Flood | D | 5 | 5.0 | 96.128 | 96.757 |
|-------|----|--------|-----------|------------|---|----|------|--------|--------|
| A | 0 | 0.0 | 97.429 | 97.526 | D | 6 | 6.0 | 96.232 | 97.022 |
| A | 1 | 1.0 | 96.976 | 97.072 | D | 7 | 7.0 | 96.332 | 97.291 |
| A | 2 | 2.0 | 96.463 | 96.742 | D | 8 | 8.0 | 96.408 | 97.344 |
| A | 3 | 3.0 | 96.276 | 96.603 | D | 9 | 8.8 | 96.481 | 97.020 |
| A | 4 | 4.0 | 96.270 | 96.614 | E | 0 | 0.0 | 96.566 | 96.692 |
| A | 5 | 5.0 | 96.260 | 96.637 | E | 1 | 1.0 | 96.121 | 96.480 |
| A | 6 | 6.0 | 96.230 | 96.635 | E | 2 | 2.0 | 96.143 | 96.347 |
| A | 7 | 7.0 | 96.264 | 96.589 | E | 3 | 3.0 | 96.192 | 96.380 |
| A | 8 | 8.0 | 96.276 | 96.724 | E | 4 | 4.0 | 96.257 | 96.535 |
| A | 9 | 9.0 | 96.355 | 97.036 | E | 5 | 5.0 | 96.348 | 96.677 |
| A | 10 | 9.9 | 96.425 | 97.386 | E | 6 | 6.0 | 96.418 | 96.717 |
| B | 0 | 0.0 | 96.237 | 96.316 | E | 7 | 7.0 | 96.515 | 96.543 |
| B | 1 | 1.0 | 95.798 | 96.114 | E | 8 | 8.0 | 96.611 | 96.372 |
| B | 2 | 2.0 | 95.794 | 96.156 | E | 9 | 9.0 | 96.667 | 96.222 |
| B | 3 | 3.0 | 95.808 | 96.196 | E | 10 | 10.0 | 96.650 | 96.150 |
| B | 4 | 4.0 | 95.820 | 96.237 | E | 11 | 11.0 | 96.640 | 96.121 |
| B | 5 | 5.0 | 95.811 | 96.249 | E | 12 | 11.9 | 96.523 | 96.095 |
| B | 6 | 6.0 | 95.839 | 96.443 | F | 0 | 0.0 | 96.310 | 96.742 |
| B | 7 | 7.0 | 95.920 | 96.738 | F | 1 | 1.0 | 96.040 | 96.551 |
| B | 8 | 8.0 | 96.055 | 96.902 | F | 2 | 2.0 | 96.072 | 96.701 |
| B | 9 | 9.0 | 96.254 | 96.955 | F | 3 | 3.0 | 96.148 | 96.913 |
| B | 10 | 9.6 | 96.403 | 96.908 | F | 4 | 4.0 | 96.214 | 97.275 |
| C | 0 | 0.0 | 96.541 | 96.653 | F | 5 | 5.0 | 96.288 | 97.427 |
| C | 1 | 1.0 | 96.082 | 96.250 | F | 6 | 6.0 | 96.402 | 97.204 |
| C | 2 | 2.0 | 95.911 | 96.233 | F | 7 | 7.0 | 96.501 | 96.689 |
| C | 3 | 3.0 | 95.926 | 96.321 | F | 8 | 8.0 | 96.540 | 96.240 |
| C | 4 | 4.0 | 95.931 | 96.457 | F | 9 | 9.0 | 96.586 | 95.927 |
| C | 5 | 5.0 | 95.938 | 96.530 | F | 10 | 10.0 | 96.156 | 95.621 |
| C | 6 | 6.0 | 95.937 | 96.577 | F | 11 | 10.4 | 95.537 | 95.618 |
| C | 7 | 7.0 | 96.014 | 96.804 | G | 0 | 0.0 | 96.396 | 96.678 |
| C | 8 | 8.0 | 96.065 | 97.064 | G | 1 | 1.0 | 95.953 | 96.440 |
| C | 9 | 9.0 | 96.153 | 97.092 | G | 2 | 2.0 | 95.946 | 96.527 |
| C | 10 | 10.0 | 96.290 | 97.059 | G | 3 | 3.0 | 95.968 | 96.698 |
| C | 11 | 11.2 | 96.464 | 97.012 | G | 4 | 4.0 | 96.043 | 96.917 |
| D | 0 | 0.0 | 96.541 | 96.576 | G | 5 | 5.0 | 96.221 | 97.360 |
| D | 1 | 1.0 | 96.020 | 96.238 | G | 6 | 6.0 | 96.347 | 97.620 |
| D | 2 | 2.0 | 96.018 | 96.330 | G | 7 | 7.0 | 96.409 | 97.744 |
| D | 3 | 3.0 | 96.054 | 96.507 | G | 8 | 8.0 | 96.461 | 97.481 |
| D | 4 | 4.0 | 96.086 | 96.683 | G | 9 | 9.0 | 96.484 | 96.738 |

| Trans | # | Offset | Pre-Flood | Post-Flood |
|-------|----|--------|-----------|------------|
| G | 10 | 10.0 | 96.477 | 96.519 |
| G | 11 | 10.6 | 96.458 | 96.437 |
| H | 0 | 0.0 | 96.526 | 96.675 |
| H | 1 | 1.0 | 96.080 | 96.223 |
| H | 2 | 2.0 | 96.055 | 96.192 |
| H | 3 | 3.0 | 96.349 | 96.538 |
| H | 4 | 4.0 | 96.522 | 96.872 |
| H | 5 | 5.0 | 96.393 | 96.596 |
| H | 6 | 5.9 | 95.972 | 96.181 |
| I | 0 | 0.0 | 96.624 | 96.752 |
| I | 1 | 1.0 | 96.515 | 96.725 |
| I | 2 | 2.0 | 96.127 | 96.347 |
| I | 3 | 2.5 | 95.846 | 95.946 |

Marsh Transect Elevations

Site: 214 L

| Trans. | # | Offset | Pre-Flood | Post-Flood | D | 6 | 6 | 91.011 | 91.413 |
|--------|----|--------|-----------|------------|---|----|----|--------|--------|
| A | 0 | 0 | 92.268 | 92.268 | D | 7 | 7 | 91.024 | 91.382 |
| A | 1 | 1 | 91.553 | 92.321 | D | 8 | 8 | 90.996 | 91.349 |
| A | 2 | 2 | 91.419 | 91.693 | D | 9 | 9 | 91.041 | 91.438 |
| A | 3 | 3 | 91.369 | 91.851 | D | 10 | 10 | 91.067 | 90.415 |
| A | 4 | 4 | 91.331 | 91.714 | E | 0 | 0 | 91.719 | 91.887 |
| A | 5 | 5 | 91.312 | 91.779 | E | 1 | 1 | 91.116 | 91.488 |
| A | 6 | 6 | 91.328 | 91.887 | E | 2 | 2 | 91.147 | 91.268 |
| A | 7 | 7 | 91.322 | 92.044 | E | 3 | 3 | 91.241 | 90.823 |
| A | 8 | 8 | 91.427 | 92.191 | F | 4 | 0 | 92.009 | 92.009 |
| B | 0 | 0 | 91.834 | 91.834 | F | 5 | 1 | 91.354 | 91.235 |
| B | 1 | 1 | 91.049 | 91.377 | F | 6 | 2 | 91.380 | 90.974 |
| B | 2 | 2 | 91.031 | 91.392 | F | 7 | 3 | 91.438 | 90.722 |
| B | 3 | 3 | 90.997 | 91.394 | F | 8 | 4 | 91.412 | 90.47 |
| B | 4 | 4 | 91.015 | 91.45 | | | | | |
| B | 5 | 5 | 91.038 | 91.427 | | | | | |
| B | 6 | 6 | 91.044 | 91.411 | | | | | |
| B | 7 | 7 | 91.081 | 91.523 | | | | | |
| B | 8 | 8 | 91.153 | 91.64 | | | | | |
| B | 9 | 9 | 91.311 | 91.769 | | | | | |
| B | 10 | 10 | 91.448 | 91.895 | | | | | |
| B | 11 | 11 | 91.396 | 91.509 | | | | | |
| C | 0 | 0 | 91.909 | 91.909 | | | | | |
| C | 1 | 1 | 91.269 | 91.599 | | | | | |
| C | 2 | 2 | 91.121 | 91.419 | | | | | |
| C | 3 | 3 | 91.080 | 91.364 | | | | | |
| C | 4 | 4 | 91.082 | 91.433 | | | | | |
| C | 5 | 5 | 91.015 | 91.384 | | | | | |
| C | 6 | 6 | 90.915 | 91.321 | | | | | |
| C | 7 | 7 | 90.865 | 91.318 | | | | | |
| C | 8 | 8 | 90.918 | 91.367 | | | | | |
| C | 9 | 9 | 90.933 | 91.473 | | | | | |
| C | 10 | 10 | 91.119 | 91.591 | | | | | |
| C | 11 | 11 | 91.306 | 91.278 | | | | | |
| D | 0 | 0 | 92.205 | 92.205 | | | | | |
| D | 1 | 1 | 91.807 | 92.013 | | | | | |
| D | 2 | 2 | 91.433 | 91.66 | | | | | |
| D | 3 | 3 | 91.224 | 91.589 | | | | | |
| D | 4 | 4 | 91.144 | 91.505 | | | | | |
| D | 5 | 5 | 91.059 | 91.44 | | | | | |



Appendix G

**Final Administrative Report on the Flood Study Modification of
Cooperative Agreement CA 1425 - 96-FC-81-05006**

Final Administrative Report: Vegetation Flood Study FY 1996

| Category | Budgeted | Expended | Difference |
|----------------------------------|-----------------|-----------------|-------------------|
| Salaries | | | |
| Technicians (Field / Lab) | | | |
| D. Bechtel | | \$ 2800.00 | |
| K. Behn | | 449.82 | |
| W Burger | | 684.00 | |
| S. Ferrier | | 612.00 | |
| A. Furgason | | 2068.00 | |
| A. Goodman | | 1449.00 | |
| S. Rhodes | | 1800.00 | |
| G. Rink | | 1080.00 | |
| Total | \$11,110.00 | \$10,942.82 | \$167.18 |
| Employee Related Expenses | | | |
| Technicians (Field / Lab) | | | |
| D. Bechtel | | \$ 238.00 | |
| K. Behn | | 38.24 | |
| W Burger | | 58.14 | |
| S. Ferrier | | 52.02 | |
| A. Furgason | | 175.78 | |
| A. Goodman | | 123.17 | |
| S. Rhodes | | 153.00 | |
| G. Rink | | 96.80 | |
| Total | \$1,250.00 | \$ 930.14 | \$ 319.86 |
| Field Supplies | | | |
| Greenhouse supplies | | \$ 117.89 | |
| Trip supplies | | 1045.98 | |
| Total | \$810.00 | \$1,163.87 | (\$353.87) |
| Office Supplies | | | |
| Photo / Xeroxing | | \$ 425.08 | |
| Books, Misc supplies | | 190.16 | |
| Total | \$1,000.00 | \$615.24 | \$384.76 |
| Total Direct Costs: | \$14,170.00 | \$13,652.07 | \$517.93 |
| Indirect Costs | | | |
| (20 % of direct): | \$ 2,834.00 | \$ 2,834.00 | |
| Total Costs: | \$17,004.00 | \$16,486.07 | \$517.93 |